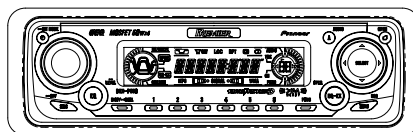


Service Manual



DEH-P550MP/XN/UC

ORDER NO.
CRT3002

MULTI-CD CONTROL HIGH POWER CD/MP3/WMA PLAYER WITH FM/AM TUNER

DEH-P550MP

XN/UC

DEH-P5500MP

XN/UC

DEH-P5550MP

XN/ES

COMPACT
disc
DIGITAL AUDIO



● This service manual should be used together with the following manual(s):

Model No.	Order No.	Mech. Module	Remarks
CX-3057	CRT3026	S10MP3	CD Mech. Module:Circuit Description, Mech.Description, Disassembly



For details, refer to "Important symbols for good services".

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SAFETY INFORMATION

CAUTION

This service manual is intended for qualified service technicians; it is not meant for the casual do-it-yourselfer. Qualified technicians have the necessary test equipment and tools, and have been trained to properly and safely repair complex products such as those covered by this manual. Improperly performed repairs can adversely affect the safety and reliability of the product and may void the warranty. If you are not qualified to perform the repair of this product properly and safely, you should not risk trying to do so and refer the repair to a qualified service technician.

WARNING

This product contains lead in solder and certain electrical parts contain chemicals which are known to the state of California to cause cancer, birth defects or other reproductive harm.
Health & Safety Code Section 25249.6 - Proposition 65

[Important symbols for good services]

In this manual, the symbols shown-below indicate that adjustments, settings or cleaning should be made securely. When you find the procedures bearing any of the symbols, be sure to fulfill them:

1. Product safety



You should conform to the regulations governing the product (safety, radio and noise, and other regulations), and should keep the safety during servicing by following the safety instructions described in this manual.

2. Adjustments



To keep the original performances of the product, optimum adjustments or specification confirmation is indispensable. In accordance with the procedures or instructions described in this manual, adjustments should be performed.

3. Cleaning



For optical pickups, tape-deck heads, lenses and mirrors used in projection monitors, and other parts requiring cleaning, proper cleaning should be performed to restore their performances.

4. Shipping mode and shipping screws



To protect the product from damages or failures that may be caused during transit, the shipping mode should be set or the shipping screws should be installed before shipping out in accordance with this manual, if necessary.

5. Lubricants, glues, and replacement parts



Appropriately applying grease or glue can maintain the product performances. But improper lubrication or applying glue may lead to failures or troubles in the product. By following the instructions in this manual, be sure to apply the prescribed grease or glue to proper portions by the appropriate amount. For replacement parts or tools, the prescribed ones should be used.

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● CD Player Service Precautions



- Before disassembling the unit, be sure to turn off the power. Unplugging and plugging the connectors during power-on mode may damage the ICs inside the unit.
- To protect the pickup unit from electrostatic discharge during servicing, take an appropriate treatment(shorting-solder) by referring to "the DISASSEMBLY" on page 59.
- After replacing the pickup unit, be sure to check the grating.(See p.56.)

1. SPECIFICATIONS

● DEH-P550MP/XN/UC

General

Power source	14.4 V DC (10.8 – 15.1 V allowable)
Grounding system	Negative type
Max. current consumption	10.0 A
Backup current	5 mA or less
Dimensions (W × H × D):	
DIN	
Chassis	178 × 50 × 157 mm (7 × 2 × 6-1/8 in.)
Nose	188 × 58 × 20 mm (7-3/8 × 2-1/4 × 3/4 in.)
D	
Chassis	178 × 50 × 162 mm (7 × 2 × 6-3/8 in.)
Nose	170 × 46 × 15 mm (6-3/4 × 1-3/4 × 5/8 in.)
Weight	1.4 kg (3.1 lbs)

Audio

Continuous power output is 22 W per channel minimum into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD.

Maximum power output	50 W × 4 50 W × 2/4 Ω + 70 W × 1/2 Ω (for subwoofer)
Load impedance	4 Ω (4 – 8 Ω [2 Ω for 1 ch] allowable)
Preout max output level/output impedance	2.2 V/1 k Ω
Equalizer (3-Band Parametric Equalizer):	
Low	
Frequency	40/80/100/160 Hz
Q Factor	0.35/0.59/0.95/1.15 (+6 dB when boosted)
Gain	±12dB
Mid	
Frequency	200/500/1k/2k Hz
Q Factor	0.35/0.59/0.95/1.15 (+6 dB when boosted)
Gain	±12dB
High	
Frequency	3.15k/8k/10k/12.5k Hz
Q Factor	0.35/0.59/0.95/1.15 (+6 dB when boosted)
Gain	±12dB
Loudness contour	
Low	+3.5 dB (100 Hz), +3 dB (10 kHz)
Mid	+10 dB (100 Hz), +6.5 dB (10 kHz)
High	+11 dB (100 Hz), +11 dB (10 kHz) (volume: –30 dB)

Tone controls:

Bass	
Frequency	40/63/100/160 Hz
Gain	±12dB
Treble	
Frequency	2.5k/4k/6.3k/10k Hz
Gain	±12dB

HPF:

Frequency	50/80/125 Hz
Slope	–12 dB/oct

Subwoofer:

Frequency	50/80/125 Hz
Slope	–18 dB/oct
Gain	±12dB
Phase	Normal/Reverse

CD player

System	Compact disc audio system
Usable discs	Compact disc
Signal format:	
Sampling frequency	44.1 kHz
Number of quantization bits	16; linear
Frequency characteristics	5 – 20,000 Hz (±1 dB)
Signal-to-noise ratio	94 dB (1 kHz) (IHF-A network)
Dynamic range	92 dB (1 kHz)
Number of channels	2 (stereo)
MP3 decoding format	MPEG-1 & 2 Audio Layer 3
WMA decoding format	Ver. 7 & 8

FM tuner

Frequency range	87.9 – 107.9 MHz
Usable sensitivity	8 dBf (0.7 μ V/75 Ω , mono, S/N: 30 dB)
50 dB quieting sensitivity	10 dBf (0.9 μ V/75 Ω , mono)
Signal-to-noise ratio	75 dB (IHF-A network)
Distortion	0.3 % (at 65 dBf, 1 kHz, stereo) 0.1 % (at 65 dBf, 1 kHz, mono)
Frequency response	30 – 15,000 Hz (±3 dB)
Stereo separation	45 dB (at 65 dBf, 1 kHz)
Selectivity	80 dB (±200 kHz)
Three-signal intermodulation (desired signal level)	30 dBf (two undesired signal level: 100 dBf)

AM tuner

Frequency range	530 – 1,710 kHz (10 kHz)
Usable sensitivity	18 μ V (S/N: 20 dB)
Signal-to-noise ratio	65 dB (IHF-A network)

● DEH-P5500MP/XN/UC

General

Power source	14.4 V DC (10.8 – 15.1 V allowable)
Grounding system	Negative type
Max. current consumption	10.0 A
Dimensions (W × H × D):	
DIN	
Chassis	178 × 50 × 157 mm (7 × 2 × 6-1/8 in.)
Nose	188 × 58 × 20 mm (7-3/8 × 2-1/4 × 3/4 in.)
D	
Chassis	178 × 50 × 162 mm (7 × 2 × 6-3/8 in.)
Nose	170 × 46 × 15 mm (6-3/4 × 1-3/4 × 5/8 in.)
Weight	1.4 kg (3.1 lbs)

Audio

Continuous power output is 22 W per channel minimum into 4 ohms, both channels driven 50 to 15,000 Hz with no more than 5% THD.

Maximum power output	50 W × 4 50 W × 2/4 Ω + 70 W × 1/2 Ω (for subwoofer)
Load impedance	4 Ω (4 – 8 Ω [2 Ω for 1 ch] allowable)
Preout max output level/output impedance	2.2 V/1 kΩ
Equalizer (3-Band Parametric Equalizer):	
Low	
Frequency	40/80/100/160 Hz
Q Factor	0.35/0.59/0.95/1.15 (+6 dB when boosted)
Gain	±12dB
Mid	
Frequency	200/500/1k/2k Hz
Q Factor	0.35/0.59/0.95/1.15 (+6 dB when boosted)
Gain	±12dB
High	
Frequency	3.15k/8k/10k/12.5k Hz
Q Factor	0.35/0.59/0.95/1.15 (+6 dB when boosted)
Gain	±12dB
Loudness contour	
Low	+3.5 dB (100 Hz), +3 dB (10 kHz)
Mid	+10 dB (100 Hz), +6.5 dB (10 kHz)
High	+11 dB (100 Hz), +11 dB (10 kHz) (volume: –30 dB)

Tone controls:

Bass	
Frequency	40/63/100/160 Hz
Gain	±12dB
Treble	
Frequency	2.5k/4k/6.3k/10k Hz
Gain	±12dB

HPF:

Frequency	50/80/125 Hz
Slope	–12 dB/oct

Subwoofer:

Frequency	50/80/125 Hz
Slope	–18 dB/oct
Gain	±12dB
Phase	Normal/Reverse

CD player

System	Compact disc audio system
Usable discs	Compact disc
Signal format:	
Sampling frequency	44.1 kHz
Number of quantization bits	16; linear
Frequency characteristics	5 – 20,000 Hz (±1 dB)
Signal-to-noise ratio	94 dB (1 kHz) (IHF-A network)
Dynamic range	92 dB (1 kHz)
Number of channels	2 (stereo)
MP3 decoding format	MPEG-1 & 2 Audio Layer 3
WMA decoding format	Ver. 7 & 8

FM tuner

Frequency range	87.9 – 107.9 MHz
Usable sensitivity	8 dBf (0.7 μV/75 Ω, mono, S/N: 30 dB)
50 dB quieting sensitivity	10 dBf (0.9 μV/75 Ω, mono)
Signal-to-noise ratio	75 dB (IHF-A network)
Distortion	0.3 % (at 65 dBf, 1 kHz, stereo) 0.1 % (at 65 dBf, 1 kHz, mono)
Frequency response	30 – 15,000 Hz (±3 dB)
Stereo separation	45 dB (at 65 dBf, 1 kHz)
Selectivity	80 dB (±200 kHz)
Three-signal intermodulation (desired signal level)	30 dBf (two undesired signal level: 100 dBf)

AM tuner

Frequency range	530 – 1,710 kHz (10 kHz)
Usable sensitivity	18 μV (S/N: 20 dB)
Signal-to-noise ratio	65 dB (IHF-A network)

● DEH-P5550MP/XN/ES

General

Rated power source 14.4 V DC
(allowable voltage range:
12.0 – 14.4 V DC)

Grounding system Negative type

Max. current consumption
..... 10.0 A

Backup current
..... 5 mA or less

Dimensions (W × H × D):

DIN

Chassis 178 × 50 × 157 mm

Nose 188 × 58 × 20 mm

D

Chassis 178 × 50 × 162 mm

Nose 170 × 46 × 15 mm

Weight 1.4 kg

Audio

Continuous power output is 22 W per channel minimum
into 4 ohms, both channels driven 50 to 15,000 Hz with
no more than 5% THD.

Maximum power output 50 W × 4
50 W × 2/4 Ω + 70 W × 1/2
Ω (for subwoofer)

Load impedance 4 Ω (4 – 8 Ω [2 Ω for 1 ch] al-
lowable)

Preout max output level/output impedance
..... 2.2 V/1 kΩ

Equalizer (3-Band Parametric Equalizer):

Low

Frequency 40/80/100/160 Hz

Q Factor 0.35/0.59/0.95/1.15 (+6 dB
when boosted)

Gain ±12dB

Mid

Frequency 200/500/1k/2k Hz

Q Factor 0.35/0.59/0.95/1.15 (+6 dB
when boosted)

Gain ±12dB

High

Frequency 3.15k/8k/10k/12.5k Hz

Q Factor 0.35/0.59/0.95/1.15 (+6 dB
when boosted)

Gain ±12dB

Loudness contour

Low +3.5 dB (100 Hz), +3 dB (10
kHz)

Mid +10 dB (100 Hz), +6.5 dB
(10 kHz)

High +11 dB (100 Hz), +11 dB
(10 kHz)
(volume: –30 dB)

Tone controls:

Bass

Frequency 40/63/100/160 Hz

Gain ±12dB

Treble

Frequency 2.5k/4k/6.3k/10k Hz

Gain ±12dB

HPF:

Frequency 50/80/125 Hz

Slope –12 dB/oct

Subwoofer:

Frequency 50/80/125 Hz

Slope –18 dB/oct

Gain ±12dB

Phase Normal/Reverse

CD player

System Compact disc audio system

Usable discs Compact disc

Signal format:

Sampling frequency 44.1 kHz

Number of quantization bits

..... 16; linear

Frequency characteristics ... 5 – 20,000 Hz (±1 dB)

Signal-to-noise ratio 94 dB (1 kHz) (IEC-A net-
work)

Dynamic range 92 dB (1 kHz)

Number of channels 2 (stereo)

MP3 decoding format MPEG-1 & 2 Audio Layer 3

WMA decoding format Ver. 7 & 8

FM tuner

Frequency range 87.5 – 108.0 MHz

Usable sensitivity 8 dBf (0.7 μV/75 Ω, mono,
S/N: 30 dB)

50 dB quieting sensitivity 10 dBf (0.9 μV/75 Ω, mono)

Signal-to-noise ratio 75 dB (IEC-A network)

Distortion 0.3 % (at 65 dBf, 1 kHz,
stereo)

0.1 % (at 65 dBf, 1 kHz,
mono)

Frequency response 30 – 15,000 Hz (±3 dB)

Stereo separation 45 dB (at 65 dBf, 1 kHz)

AM tuner

Frequency range 531 – 1,602 kHz (9 kHz)

530 – 1,640 kHz (10 kHz)

Usable sensitivity 18 μV (S/N: 20 dB)

Signal-to-noise ratio 65 dB (IEC-A network)

Infrared remote control

Wavelength 940 nm ±50 nm

Output typ; 12 mw/sr per Infrared
LED



5



6



7



8



A



B



C



D



E



F



5



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DEH-P550MP/XN/UC



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2. EXPLODED VIEWS AND PARTS LIST

2.1 PACKING(DEH-P550MP/XN/UC, DEH-P5500MP/XN/UC)

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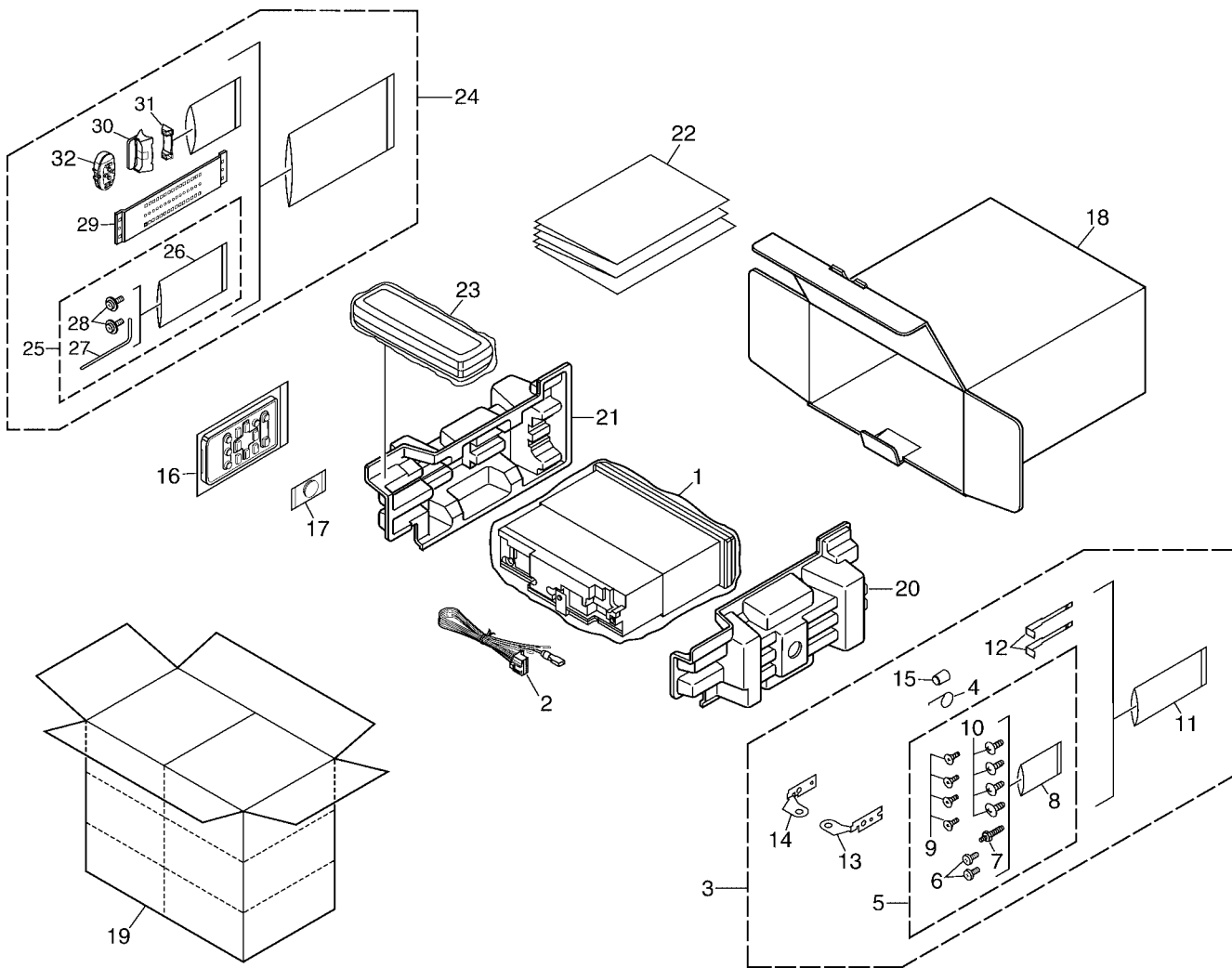
B

C

D

E

F



NOTE:

- Parts marked by "*" are generally unavailable because they are not in our Master Spare Parts List.
- Screws adjacent to ∇ mark on the product are used for disassembly.
- For the applying amount of lubricants or glue, follow the instructions in this manual.
(In the case of no amount instructions, apply as you think it appropriate.)

(1) PACKING(DEH-P550MP/XN/UC, DEH-P5500MP/XN/UC) SECTION PARTS LIST

Mark No.	Description	Part No.	Mark No.	Description	Part No.
1	Polyethylene Bag	CEG1173	21	Protector	CHP2664
2	Cord Assy	CDE7154	22-1	Owner's Manual	See Contrast table(2)
3	Accessory Assy	CEA3376	22-2	Installation Manual	See Contrast table(2)
4	Spring	CBH1650	* 22-3	Warranty Card	See Contrast table(2)
5	Screw Assy	CEA3848	* 22-4	Card	See Contrast table(2)
6	Fixing Screw	BPZ20P060FZK	23	Case Assy	CXB3520
7	Screw	CBA1650	24	Remote Control Assy	See Contrast table(2)
* 8	Polyethylene Bag	CEG-127	25	Screw Assy	See Contrast table(2)
9	Screw	CRZ50P090FTC	* 26	Polyethylene Bag	See Contrast table(2)
10	Screw	TRZ50P080FTC	* 27	Hexagonal Wrench	See Contrast table(2)
* 11	Polyethylene Bag	CEG-158	* 28	Screw	See Contrast table(2)
12	Handle	CNC5395	29	Belt	See Contrast table(2)
13	Holder	CND1249	30	Holder Assy	See Contrast table(2)
14	Holder	CND1250	31	Holder Assy	See Contrast table(2)
15	Bush	CNV3930	32	Remote Control Assy	See Contrast table(2)
16	Remote Control Unit	See Contrast table(2)			
* 17	Battery	See Contrast table(2)			
18	Carton	See Contrast table(2)			
19	Contain Box	See Contrast table(2)			
20	Protector	CHP2663			

(2) CONTRAST TABLE

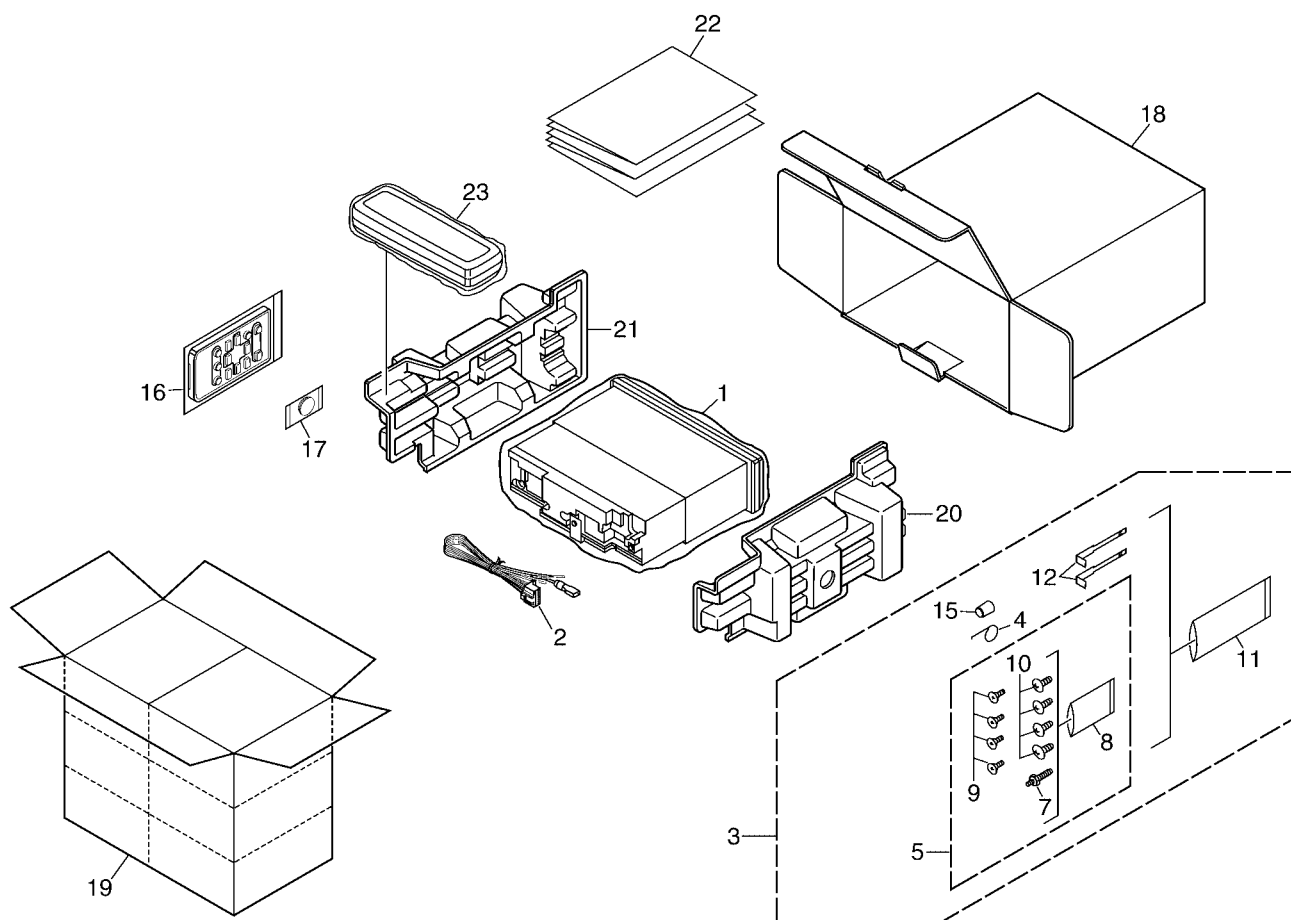
DEH-P550MP/XN/UC and DEH-P5500MP/XN/UC are constructed the same except for the following:

Mark No.	Symbol and Description	Part No.	
		DEH-P550MP/XN/UC	DEH-P5500MP/XN/UC
* 16	Remote Control Unit	Not used	CXC1265
* 17	Battery	CEX1030	CEX1065
18	Carton	CHG4942	CHG4943
19	Contain Box	CHL4942	CHL4943
22-1	Owner's Manual	CRD3720	CRD3722
22-2	Installation Manual	CRD3721	CRD3723
* 22-3	Warranty Card	CRY1070	Not used
* 22-4	Card	Not used	ARY1048
24	Remote Control Assy	CXB9202	Not used
25	Screw Assy	CZE3169	Not used
* 26	Polyethylene Bag	CEG-127	Not used
* 27	Hexagonal Wrench	CZE3176	Not used
* 28	Screw	RMZ30H060FBK	Not used
29	Belt	CZN7661	Not used
30	Holder Assy	CZX3172	Not used
31	Holder Assy	CZX3173	Not used
32	Remote Control Assy	CZX3257	Not used

● Owner's Manual, Installation Manual

Model	Part No.	Language
DEH-P550MP/XN/UC	CRD3720	English, French, Spanish
	CRD3721	
DEH-P5500MP/XN/UC	CRD3722	English, French, Spanish
	CRD3723	

2.2 PACKING(DEH-P5550MP/XN/ES)



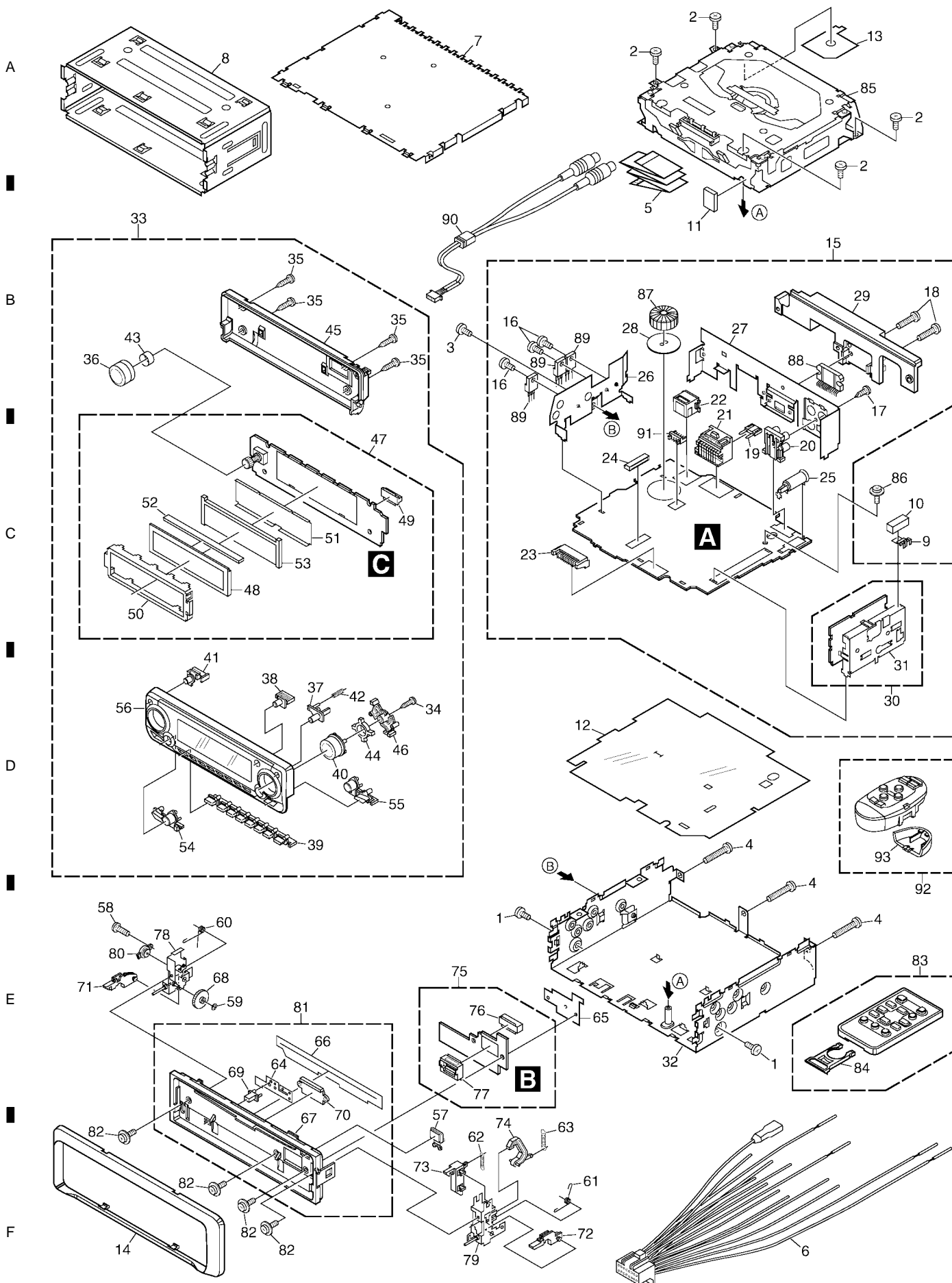
● PACKING(DEH-P5550MP/XN/ES) SECTION PARTS LIST

Mark No.	Description	Part No.	Mark No.	Description	Part No.
	1 Polyethylene Bag	CEG-162		16 Remote Control Unit	CXC1265
	2 Cord Assy	CDE7154	*	17 Battery	CEX1065
	3 Accessory Assy	CEA3439		18 Carton	CHG4944
	4 Spring	CBH1650		19 Contain Box	CHL4944
	5 Screw Assy	CEA3849		20 Protector	CHP2663
	6			21 Protector	CHP2664
	7 Screw	CBA1650		22-1 Owner's Manual	CRD3724
*	8 Polyethylene Bag	CEG-127		22-2 Owner's Manual	CRD3725
	9 Screw	CRZ50P090FTC		22-3 Installation Manual	CRD3726
	10 Screw	TRZ50P080FTC		23 Case Assy	CXB3520
*	11 Polyethylene Bag	CEG-158			
	12 Handle	CNC5395			
	13				
	14				
	15 Bush	CNV3930			

● Owner's Manual, Installation Manual

Model	Part No.	Language
DEH-P5550MP/XN/ES	CRD3724	English, Spanish, Portuguese(B)
	CRD3725	Traditional Chinese, Arabic
	CRD3726	English, Spanish, Portuguese(B) Traditional Chinese, Arabic

2.3 EXTERIOR



(1) EXTERIOR SECTION PARTS LIST

Mark No.	Description	Part No.	Mark No.	Description	Part No.	
1	Screw	BMZ30P040FZK	46	Holder	CNV7405	A
2	Screw	BSZ26P060FTC	47	Keyboard Unit	CWM8605	
3	Screw	BSZ30P060FTC	48	LCD	CAW1755	
4	Screw	BSZ30P200FTC	49	Connector(CN1901)	CKS4524	
5	Cable	CDE7065	50	Holder	CND1215	
6	Cord Assy	CDE7154	51	Sheet	CNM7921	
7	Case	CNB2870	52	Connector	CNV7365	
8	Holder	CNC8659	53	Lighting Conductor	CNV7406	
9	Earth Plate	CNC8915	54	Button Unit(SRC, EQ)	CXB9924	B
10	Cushion	CNM4870	55	Button Unit(BAND, EQ-EX)	CXB9925	
11	Insulator	CNM7682	56	Sub Grille Assy	See Contrast table(2)	
12	Insulator	CNM7935	57	Button(EJECT)	CAC7752	
13	Insulator	CNM8174	58	Screw(M2x4)	CBA1649	
14	Panel	See Contrast table(2)	59	Washer	CBF1038	
15	Tuner Amp Unit	See Contrast table(2)	60	Spring	CBH2650	
16	Screw	ASZ26P060FTC	61	Spring	CBH2651	
17	Screw	BPZ26P080FTC	62	Spring	CBH2652	
18	Screw	BSZ26P160FTC	63	Spring	CBH2653	
19	Fuse(10A)	CEK1208	64	Spring	CBL1512	C
20	Pin Jack(CN352)	CKB1051	65	Holder	CND1254	
21	Plug(CN901)	CKM1376	66	Cover	CNM6854	
22	Connector(CN101)	CKS3408	67	Panel	CNS7245	
23	Plug(CN801)	CKS3537	68	Gear	CNV5997	
24	Connector(CN651)	CKS3837	69	Pin	CNV6486	
25	Antenna Jack(CN401)	CKX1056	70	Lighting Conductor	CNV6487	
26	Holder	CND1352	71	Arm	CNV7400	
27	Holder	See Contrast table(2)	72	Arm	CNV7401	
28	Insulator	CNM8245	73	Arm	CNV7402	
29	Heat Sink	CNR1668	74	Arm	CNV7403	D
30	FM/AM Tuner Unit	CWE1646	75	Panel Unit	CWM8758	
31	Holder	CND1054	76	Socket(CN1950)	CKS3550	
32	Chassis Unit	CXB9528	77	Connector(CN1951)	CKS4462	
33	Detach Grille Assy	See Contrast table(2)	78	Holder Unit	CXB9501	
34	Screw	BPZ20P060FTC	79	Holder Unit	CXB9502	
35	Screw	BPZ20P100FZK	80	Damper Unit	CXB9503	
36	Knob	See Contrast table(2)	81	Service Panel Unit	CXX1691	
37	Button(OPEN)	CAC7728	82	Screw	IMS20P045FZK	
38	Button(AUDIO)	CAC7729	83	Remote Control Unit	See Contrast table(2)	E
39	Button(DISP, 1-6, FUNC)	CAC7730	84	Cover	See Contrast table(2)	
40	Button(SELECT)	See Contrast table(2)	85	CD Mechanism Module(S10MP3)	CXK5661	
41	Button(CLK)	CAC7751	86	Screw	ISS26P055FTC	
42	Spring	CBH2654	87	Choke Coil(L301)	CTH1280	
43	Spring	CBL1470	88	IC(IC301)	PAL007A	
44	Cushion	CNM8291	89	Transistor(Q651, 911, 921)	2SD2396	
45	Cover	CNS7247	90	Cord Assy	See Contrast table(2)	
			91	Plug(CN351)	See Contrast table(2)	
			92	Remote Control Assy	See Contrast table(2)	
			93	Cover	See Contrast table(2)	F

(2) CONTRAST TABLE

DEH-P550MP/XN/UC, DEH-P5500MP/XN/UC and DEH-P5550MP/XN/ES are constructed the same except for the following:

Mark No.	Symbol and Description	Part No.		
		DEH-P550MP/XN/UC	DEH-P5500MP/XN/UC	DEH-P5550MP/XN/ES
14	Panel	CNS6935	CNS6934	CNS6935
15	Tuner Amp Unit	CWM8588	CWM8589	CWM8590
27	Holder	CND1239	CND1477	CND1477
33	Detach Grille Assy	CXB9672	CXB9673	CXB9674
36	Knob	CAA2755	CAA2753	CAA2755
40	Button(SELECT)	CAC7733	CAC7731	CAC7733
56	Sub Grille Assy	CXB9971	CXB9972	CXB9973
83	Remote Control Unit	Not used	CXC1265	CXC1265
84	Cover	Not used	CNS7068	CNS7068
90	Cord Assy	CDE7129	Not used	Not used
91	Plug(CN351)	CKS1238	Not used	Not used
92	Remote Control Assy	CZX3257	Not used	Not used
93	Cover	CZN7655	Not used	Not used



5



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8



A



B



C



D



E



F



5



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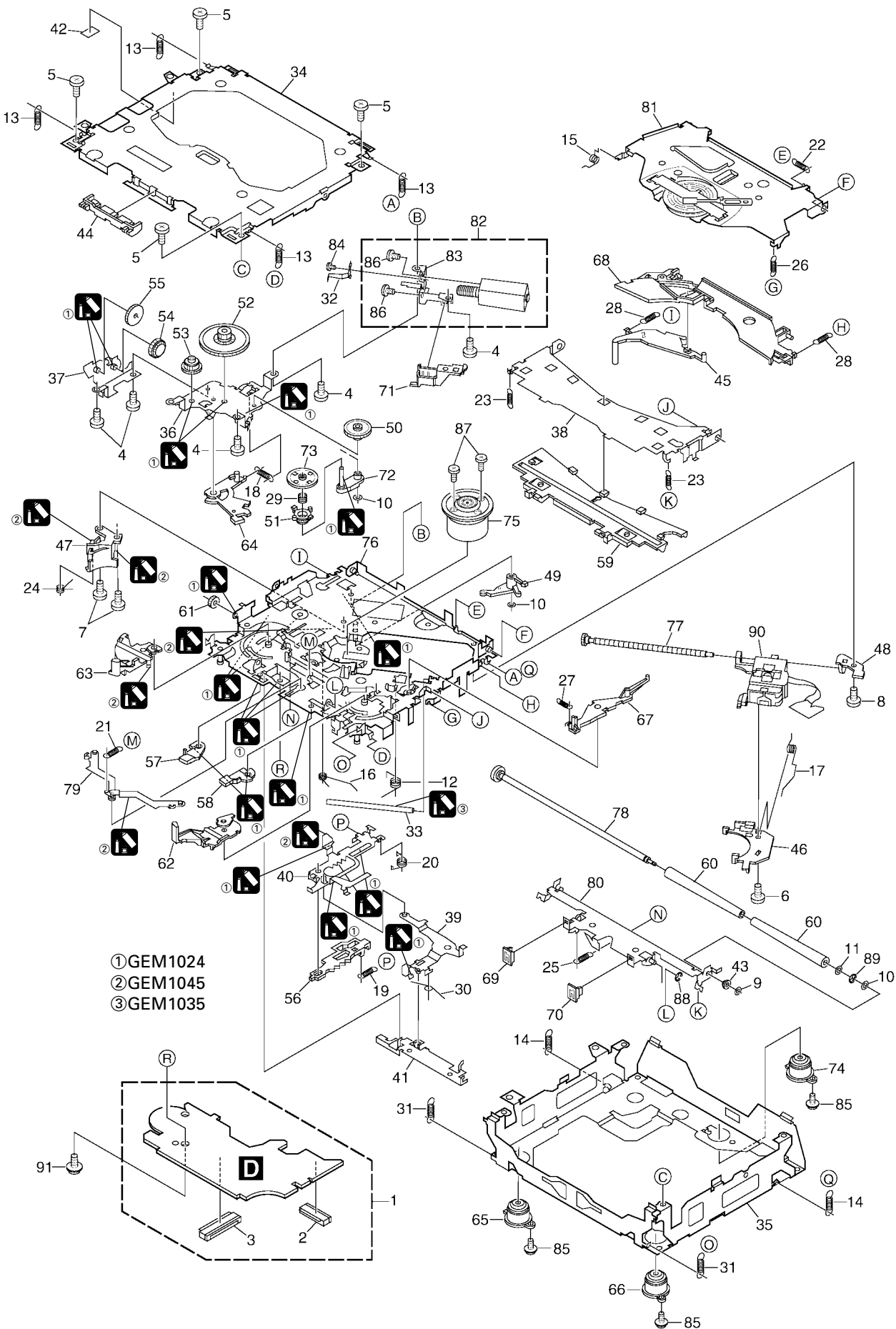
7



8



2.4 CD MECHANISM MODULE



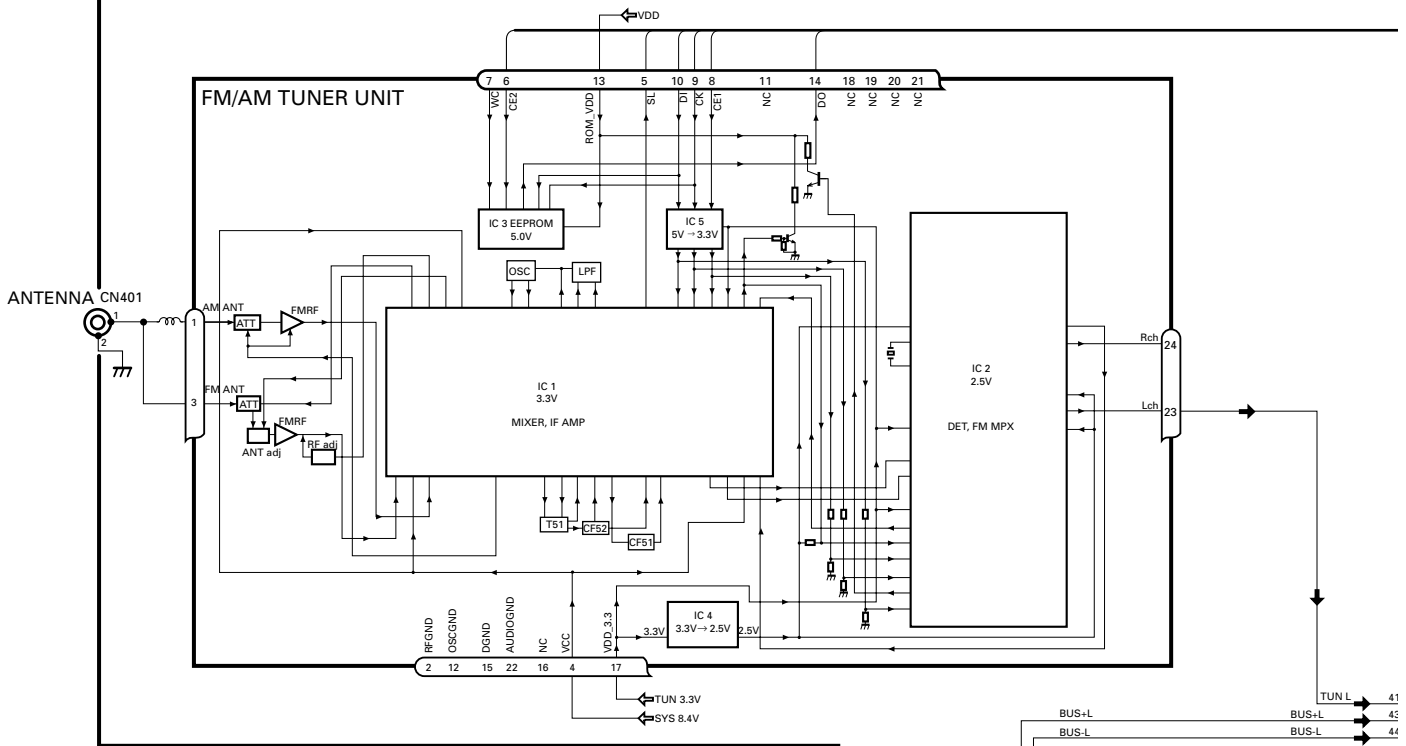
● CD MECHANISM MODULE SECTION PARTS LIST

Mark No.	Description	Part No.	Mark No.	Description	Part No.	
1	CD Core Unit(S10MP3)	CWX2743	46	Rack	CNV7199	
2	Connector(CN101)	CKS4182	47	Holder	CNV7201	
3	Connector(CN901)	CKS4017	48	Holder	CNV7202	
4	Screw	BMZ20P035FTC	49	Arm	CNV7203	
5	Screw	BSZ20P040FTC	50	Gear	CNV7207	
6	Screw(M2x4)	CBA1362	51	Gear	CNV7208	
7	Screw(M2x3)	CBA1511	52	Gear	CNV7209	
8	Screw(M2x3)	CBA1527	53	Gear	CNV7210	
9	Washer	CBF1037	54	Gear	CNV7211	
10	Washer	CBF1038	55	Gear	CNV7212	
11	Washer	CBF1060	56	Rack	CNV7214	
12	Spring	CBH2390	57	Arm	CNV7215	
13	Spring	CBH2606	58	Arm	CNV7216	
14	Spring	CBH2607	59	Guide	CNV7217	
15	Spring	CBH2608	60	Roller	CNV7218	
16	Spring	CBH2609	61	Gear	CNV7219	
17	Spring	CBH2610	62	Arm	CNV7221	
18	Spring	CBH2611	63	Arm	CNV7220	
19	Spring	CBH2612	64	Arm	CNV7222	
20	Spring	CBH2613	65	Damper	CNV7313	
21	Spring	CBH2614	66	Damper	CNV7314	
22	Spring	CBH2615	67	Arm	CNV7341	
23	Spring	CBH2616	68	Arm	CNV7342	
24	Spring	CBH2617	69	Guide	CNV7360	
25	Spring	CBH2620	70	Guide	CNV7361	
26	Spring	CBH2621	71	Holder	CNV7437	
27	Spring	CBH2641	72	Arm	CNV7444	
28	Spring	CBH2642	73	Gear	CNV7595	
29	Spring	CBH2643	74	Damper	CNV7618	
30	Spring	CBH2659	75	Motor Unit(M1)	CXB6007	
31	Spring	CBH2688	76	Chassis Unit	CXB8728	
* 32	Spring	CBL1614	77	Screw Unit	CXB8729	
33	Shaft	CLA3845	78	Gear Unit	CXB8731	
34	Frame	CNC9962	79	Arm Unit	CXB8732	
35	Frame	CNC9963	80	Arm Unit	CXB8735	
36	Bracket	CNC9966	81	Arm Unit	CXB8852	
37	Bracket	CNC9967	82	Motor Unit(M2)	CXB8933	
38	Arm	CNC9968	83	Bracket	CNC9985	
39	Arm	CNC9973	84	Screw	JFZ20P020FTC	
40	Lever	CNC9983	85	Screw(M2x5)	EBA1028	
41	Lever	CNC9984	86	Screw	JFZ20P020FTC	
42	Sheet	CNM8134	87	Screw	JGZ17P022FTC	
43	Collar	CNV6906	88	Washer	YE15FTC	
44	Guide	CNV6925	89	Washer	YE20FTC	
45	Arm	CNV7198	90	Pickup Unit(Service)(P10)	CXX1641	
			91	Screw	IMS26P030FMC	

3. BLOCK DIAGRAM AND SCHEMATIC DIAGRAM

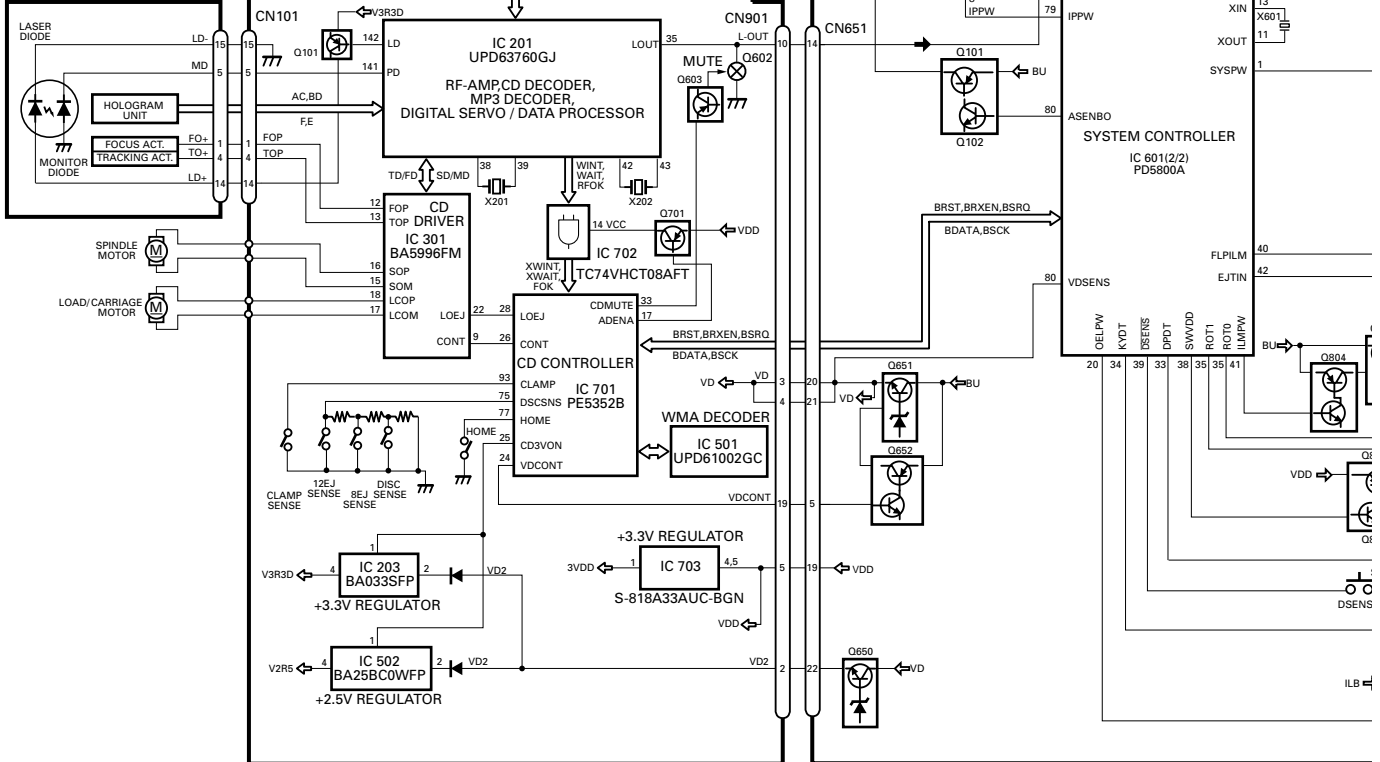
3.1 BLOCK DIAGRAM

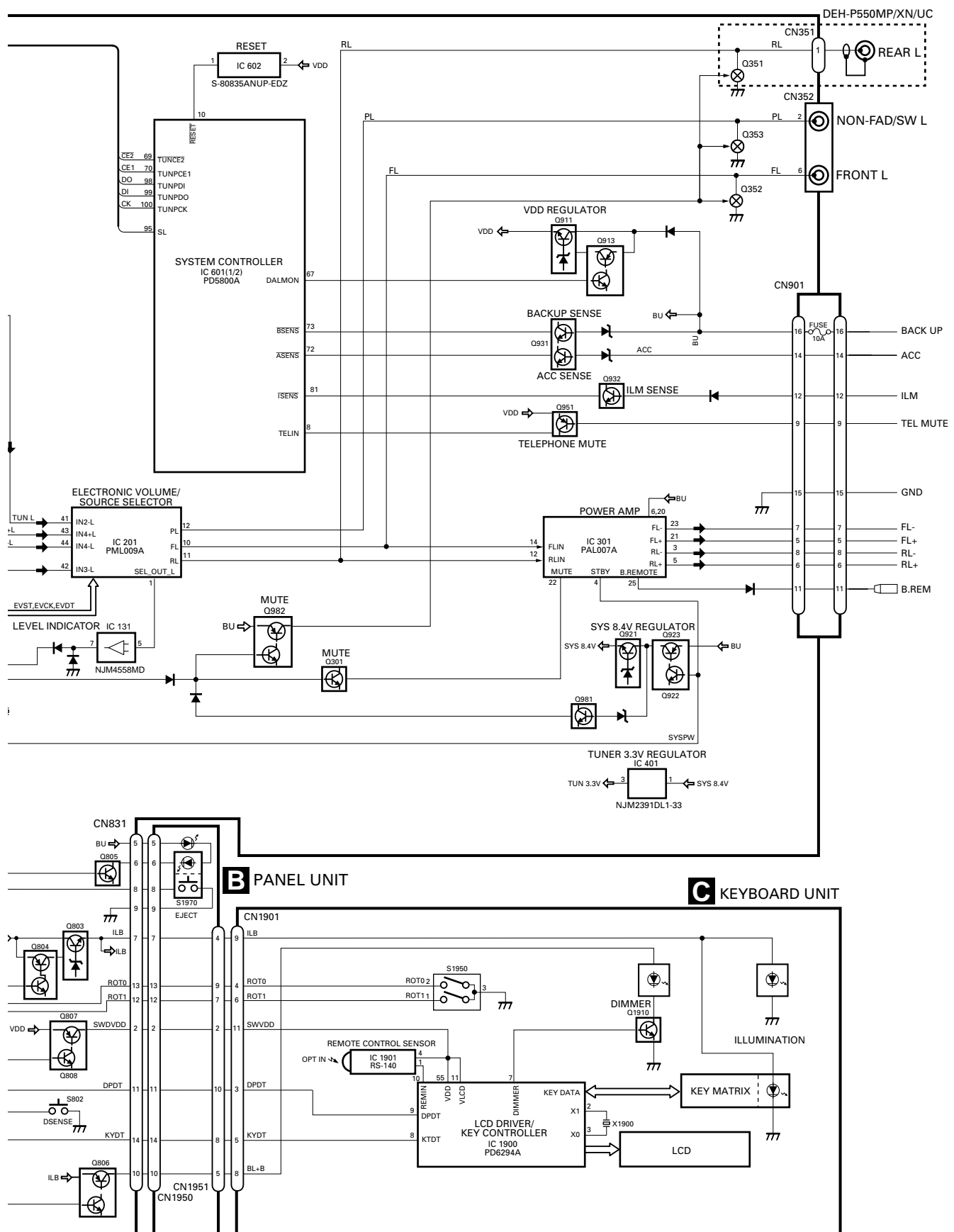
A TUNER AMP UNIT



D CD CORE UNIT(S10MP3)

PICKUP UNIT (SERVICE)(P10)

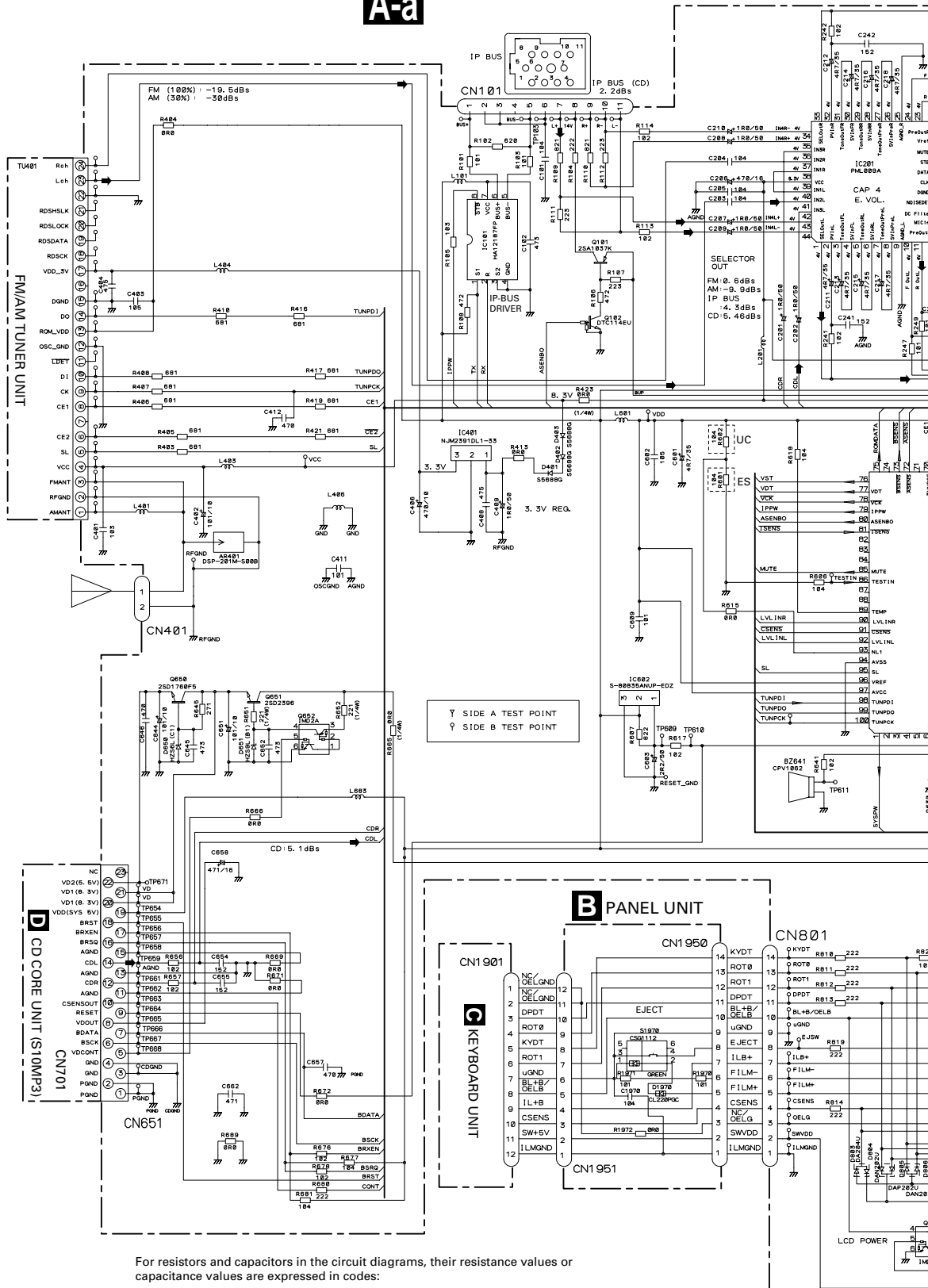
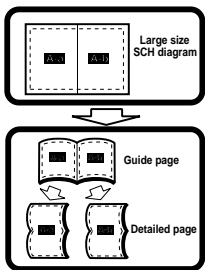




3.2 OVERALL CONNECTION DIAGRAM(GUIDE PAGE)

Note: When ordering service parts, be sure to refer to "EXPLODED VIEWS AND PARTS LIST" or "ELECTRICAL PARTS LIST".

A-a



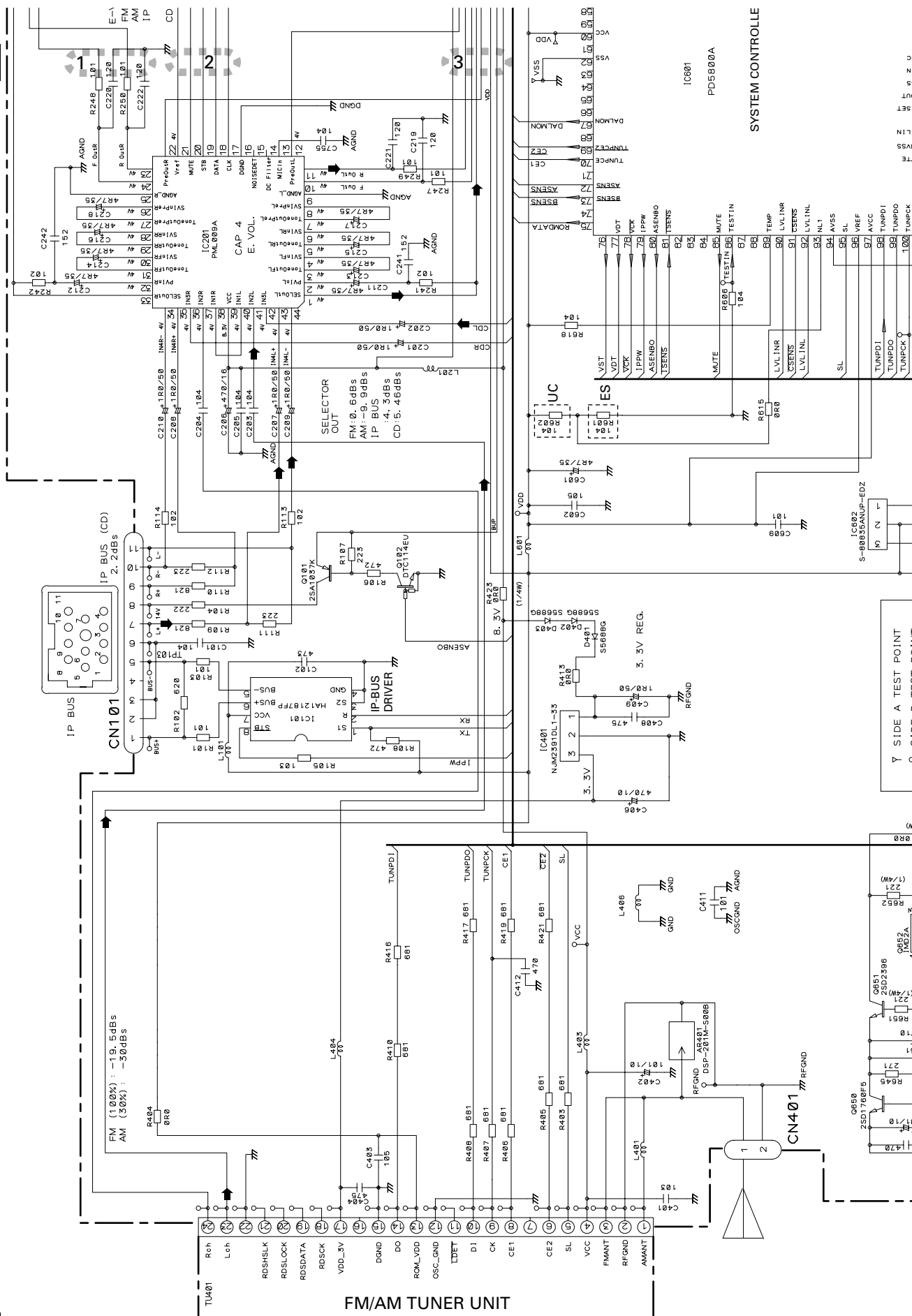
For resistors and capacitors in the circuit diagrams, their resistance values or capacitance values are expressed in codes:

Ex. *Resistors
Code Practical value
123 12k ohms
103 10k ohms

*Capacitors
Code Practical value
103 0.01uF
101/10 100uF/10V

F



A-b

A-a



23

F

E

D

C

B

A

24

A-b

A-a A-b

1

2

3

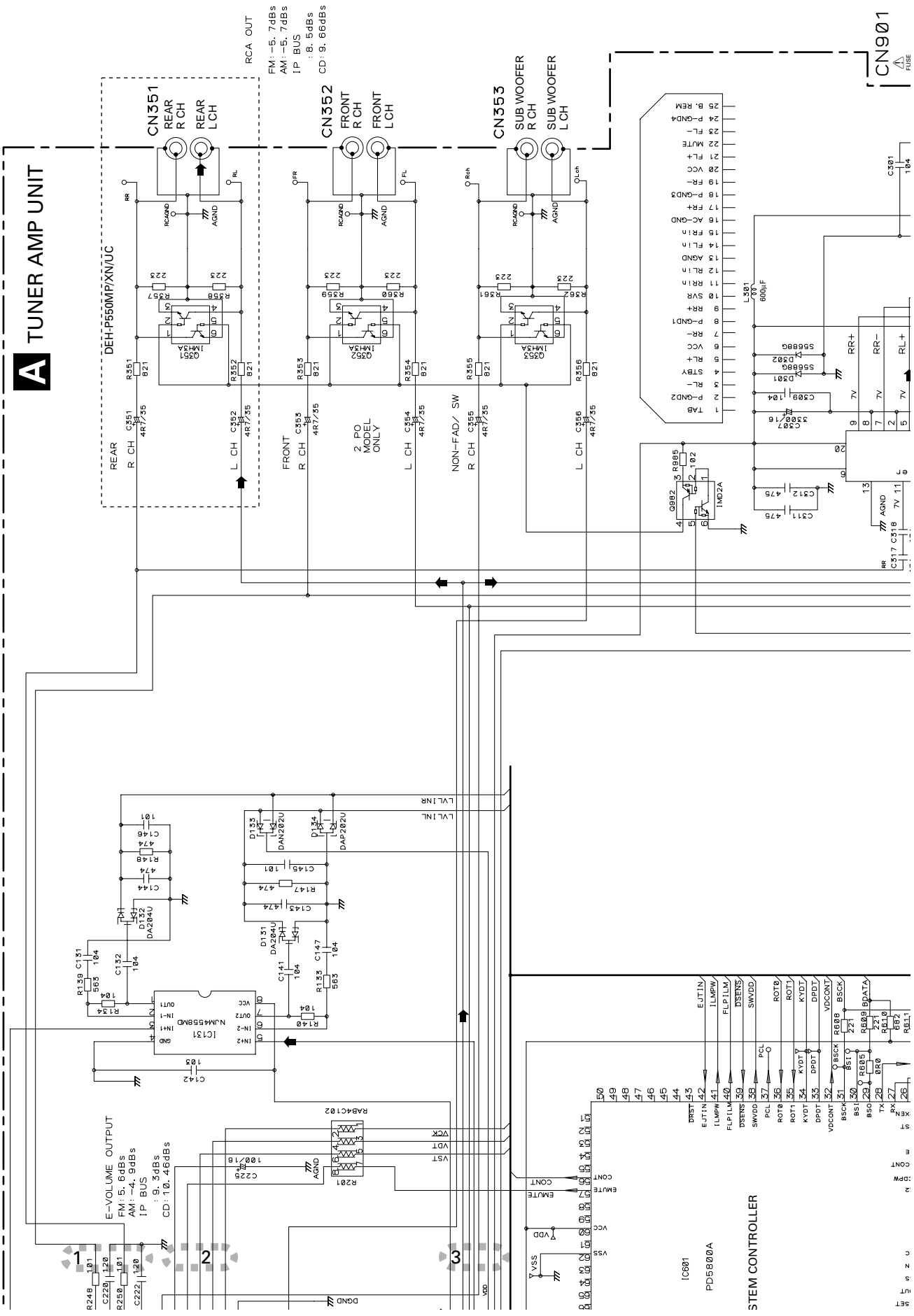
4

1

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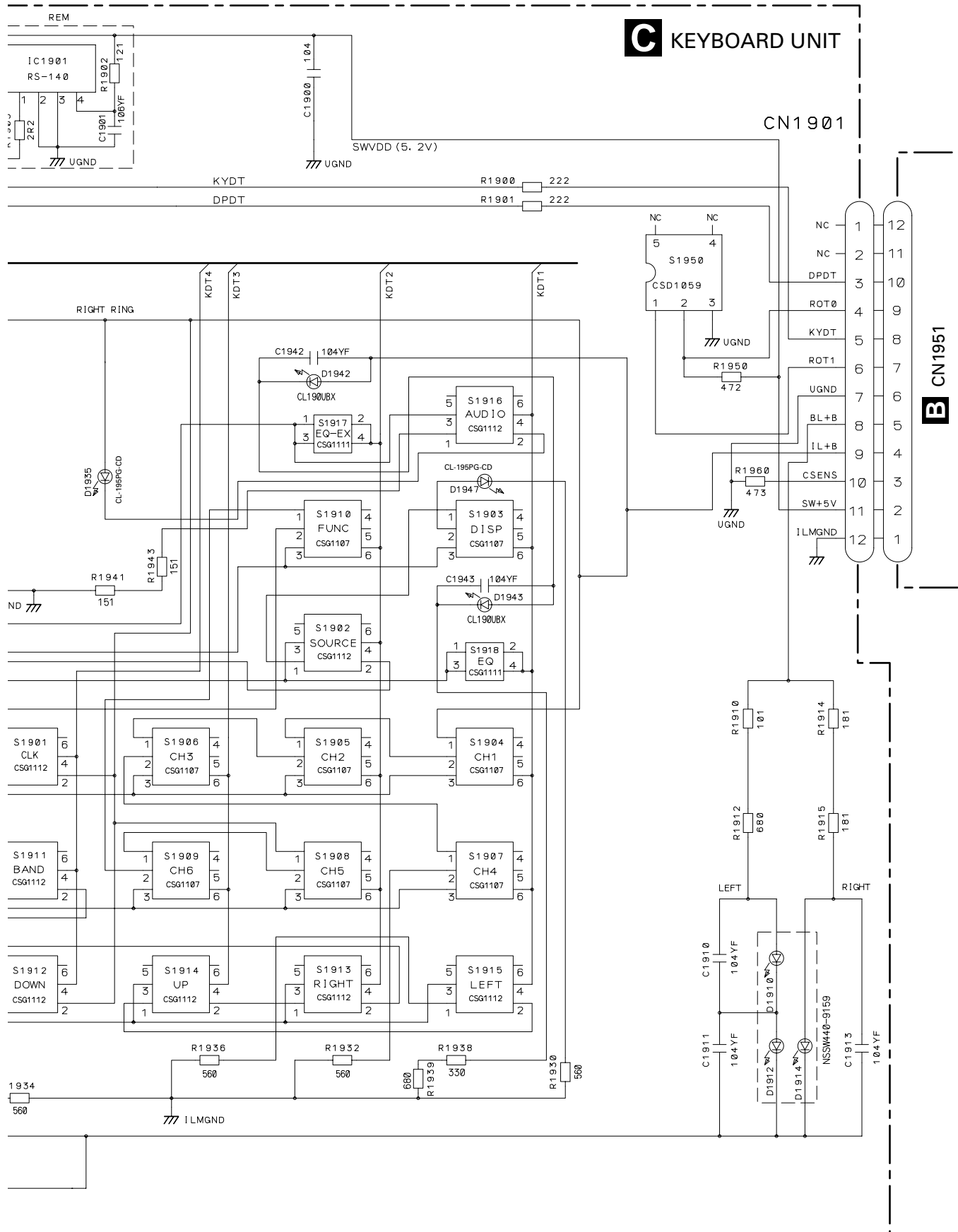
4



CN901

26





3.4 CD MECHANISM MODULE(GUIDE PAGE)

A

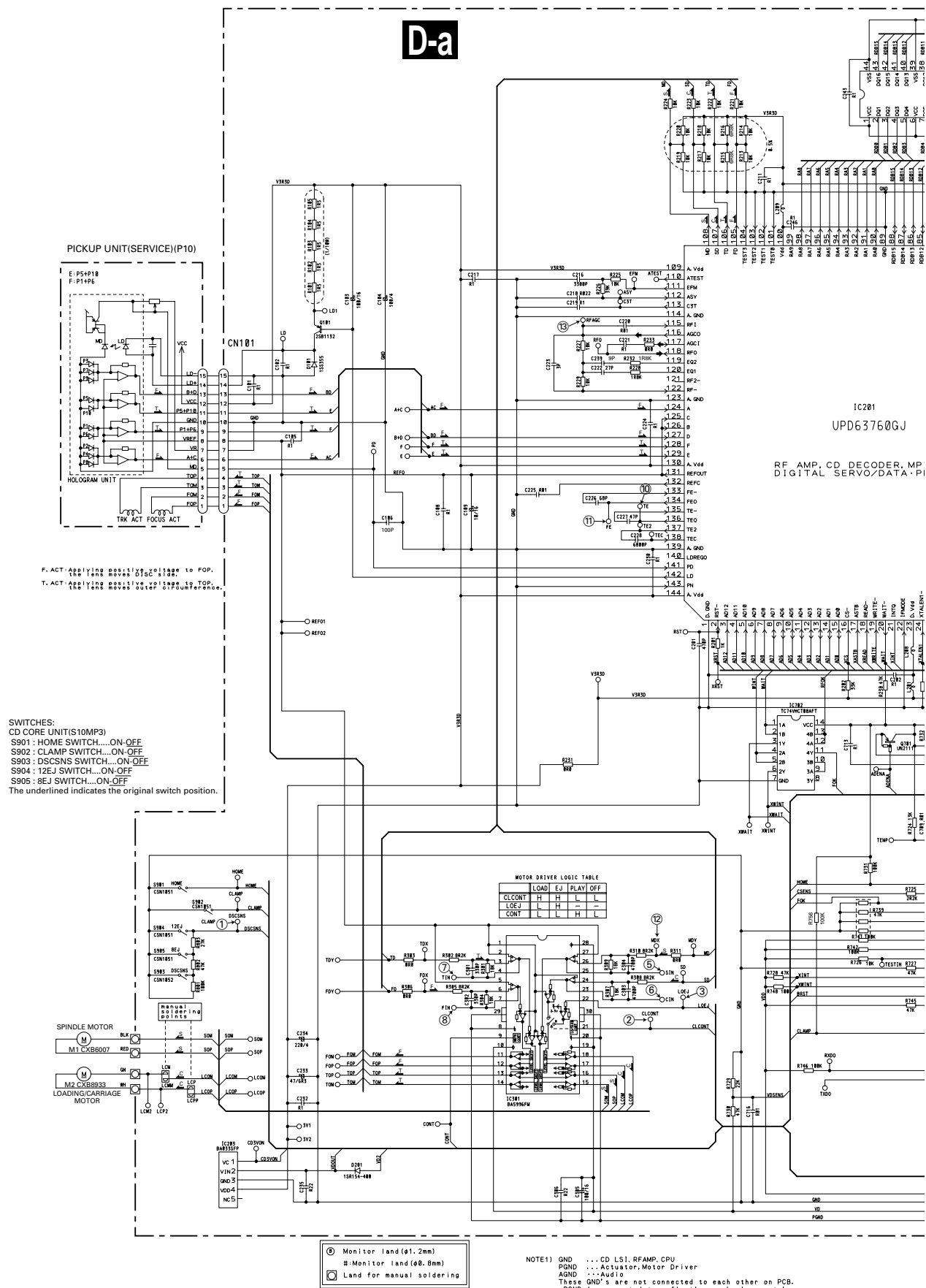
B

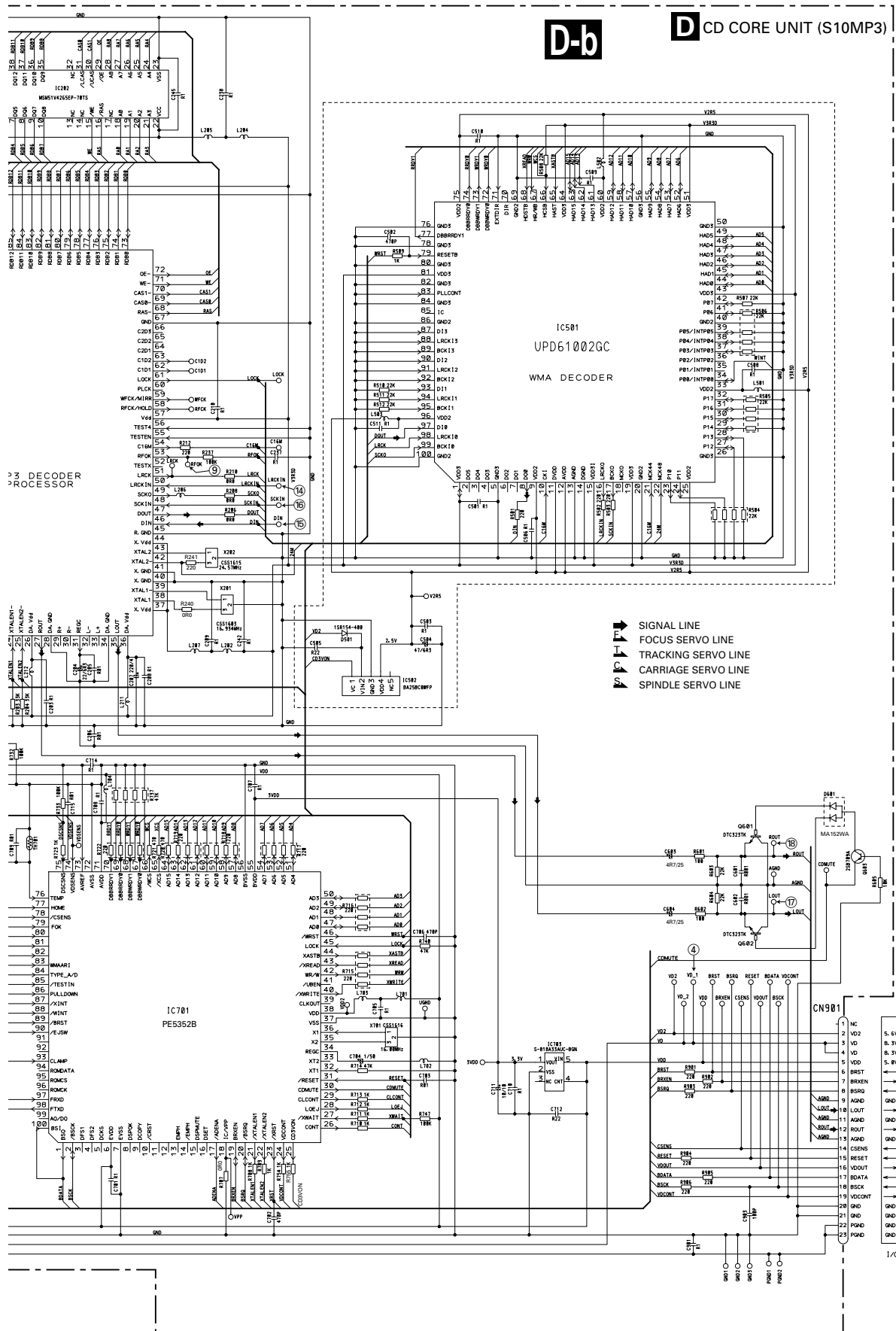
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A

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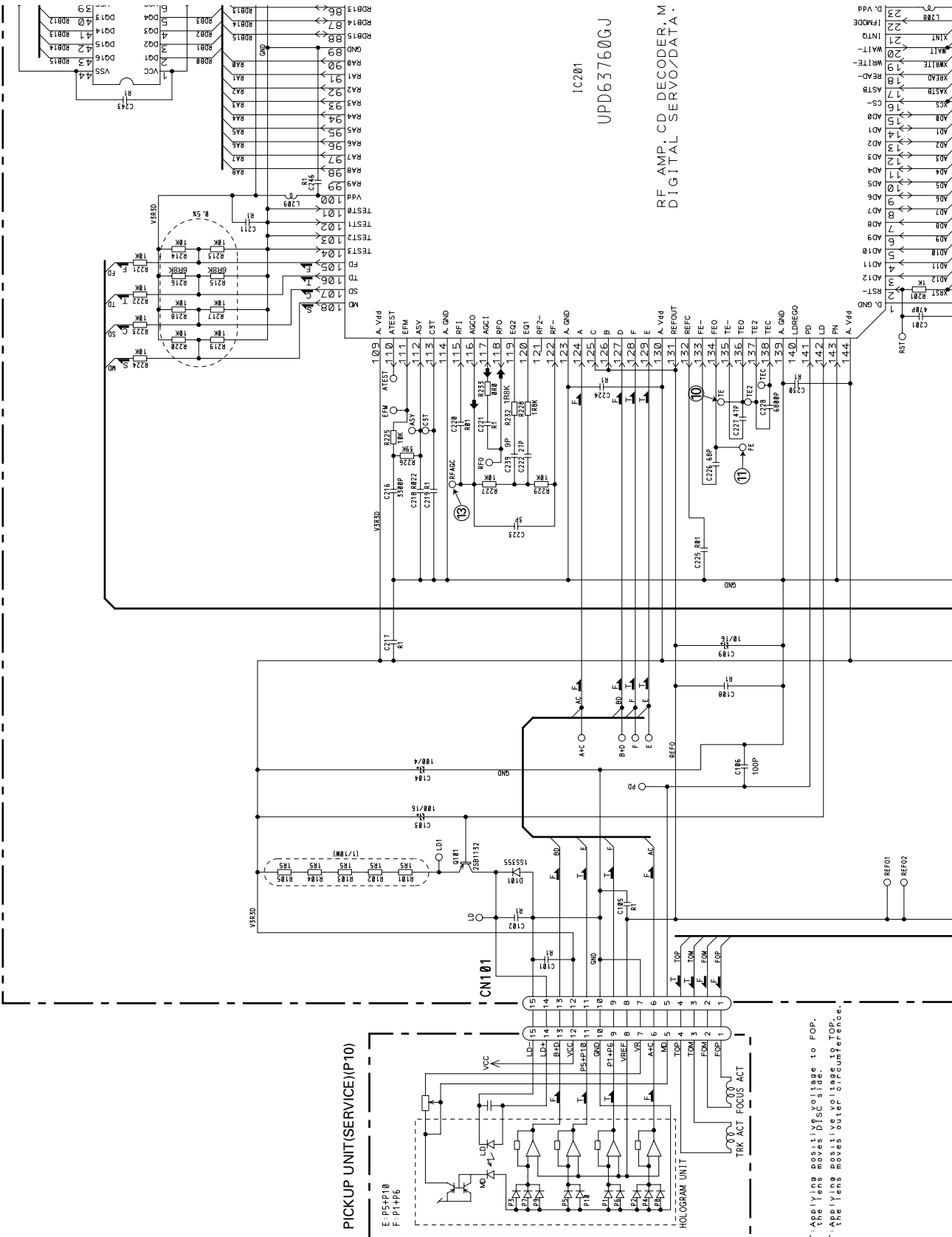
E

F

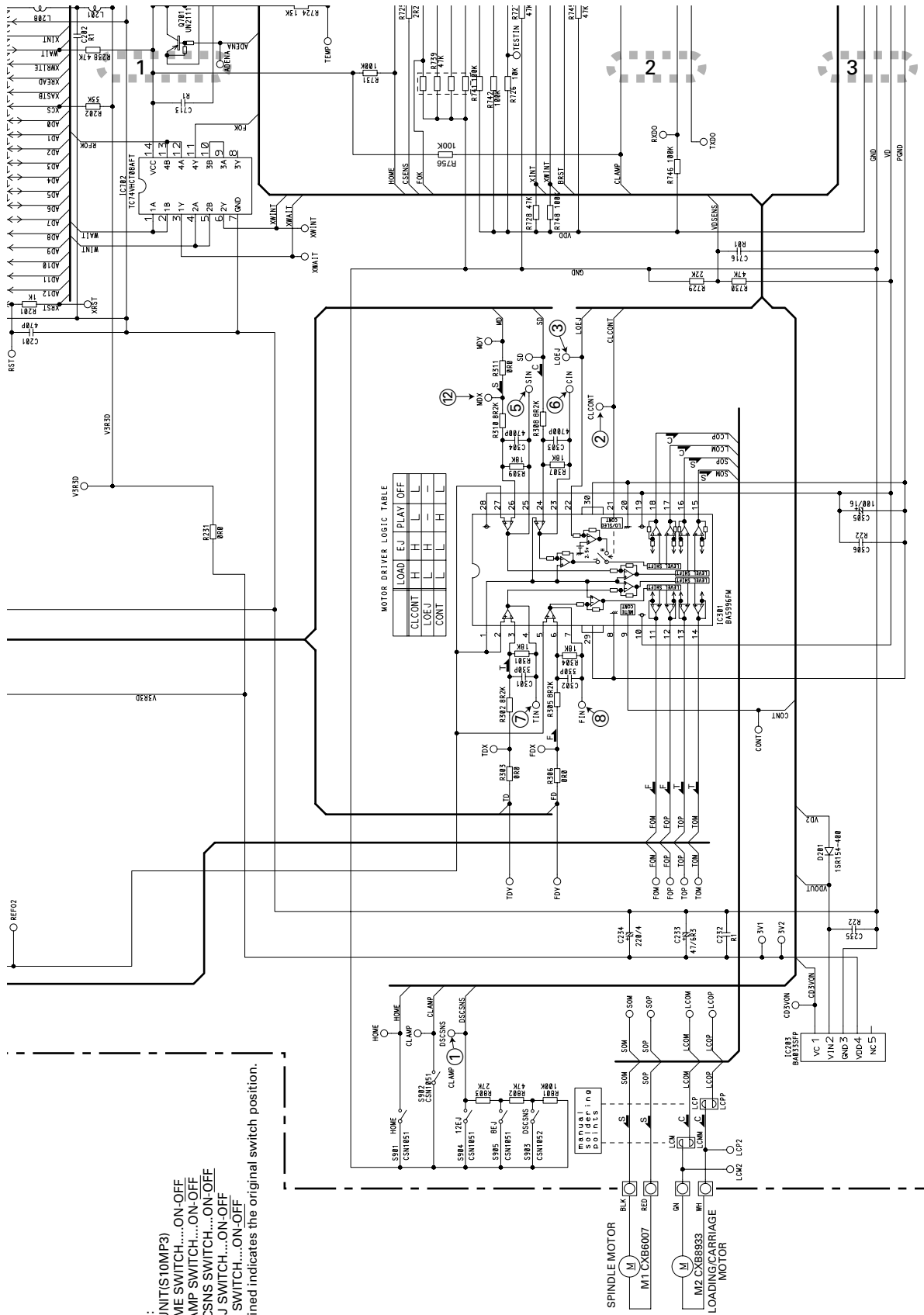
D-b

D-a D-b

D-a



F. ACT: Applying positive voltage to FOP, the lens moves 0.5µs stage.
T. ACT: Applying positive voltage to TOP, the lens moves outer circumference.



① Monitor land (φ1.2mm)
 # Monitor land (φ0.8mm)
 ☐ Land for manual soldering

NOTE1) GND ...CD LSI, RFAMP, CPU
 PGND ...Actuator, Motor Driver
 AGND ...Audio
 These GND's are not connected to each other on PCB.
 PGND is connected to a floating mechanism part by a screw.

D-b

D-a
 D-b

D-a

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B

C

D

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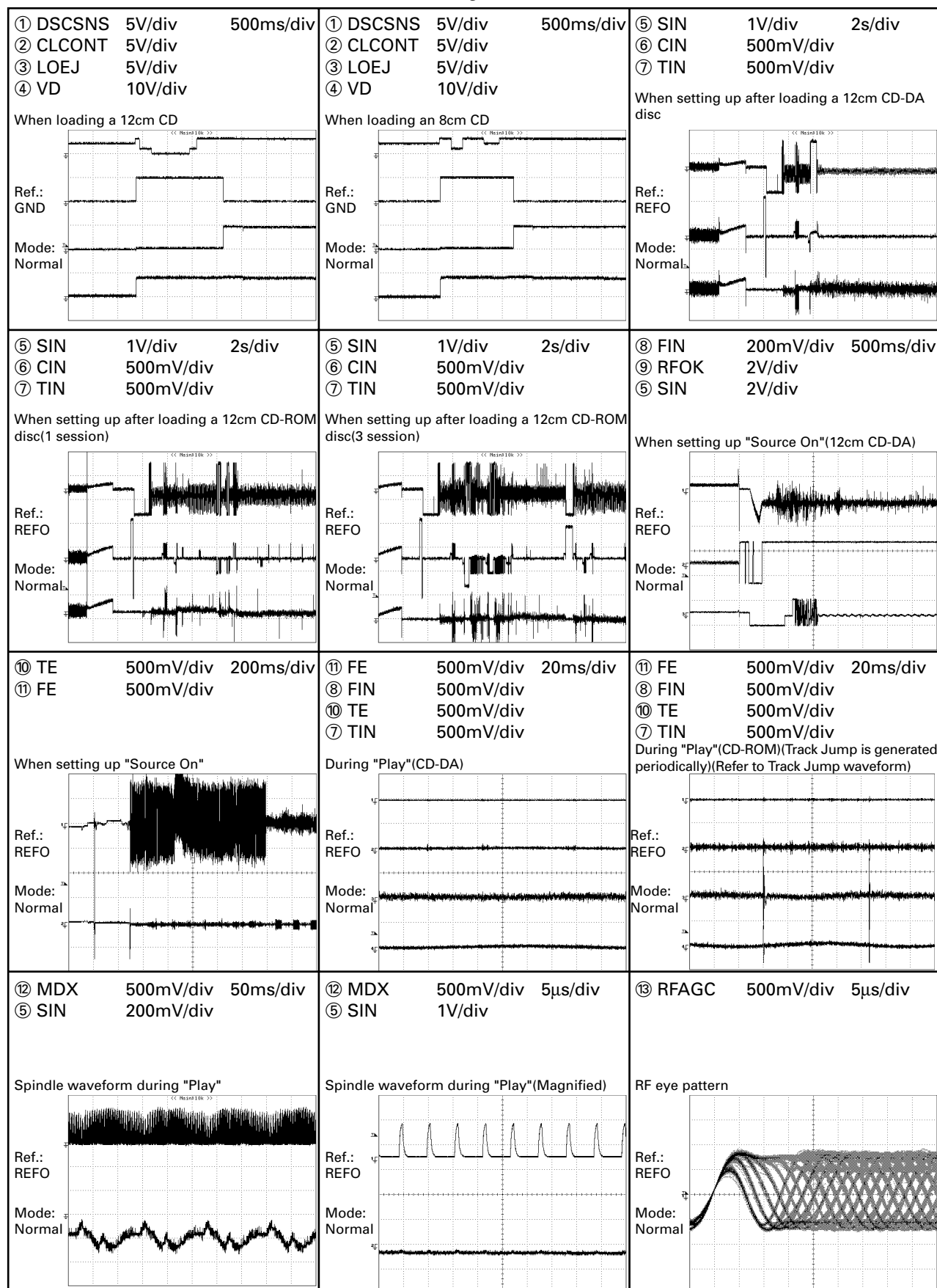
A

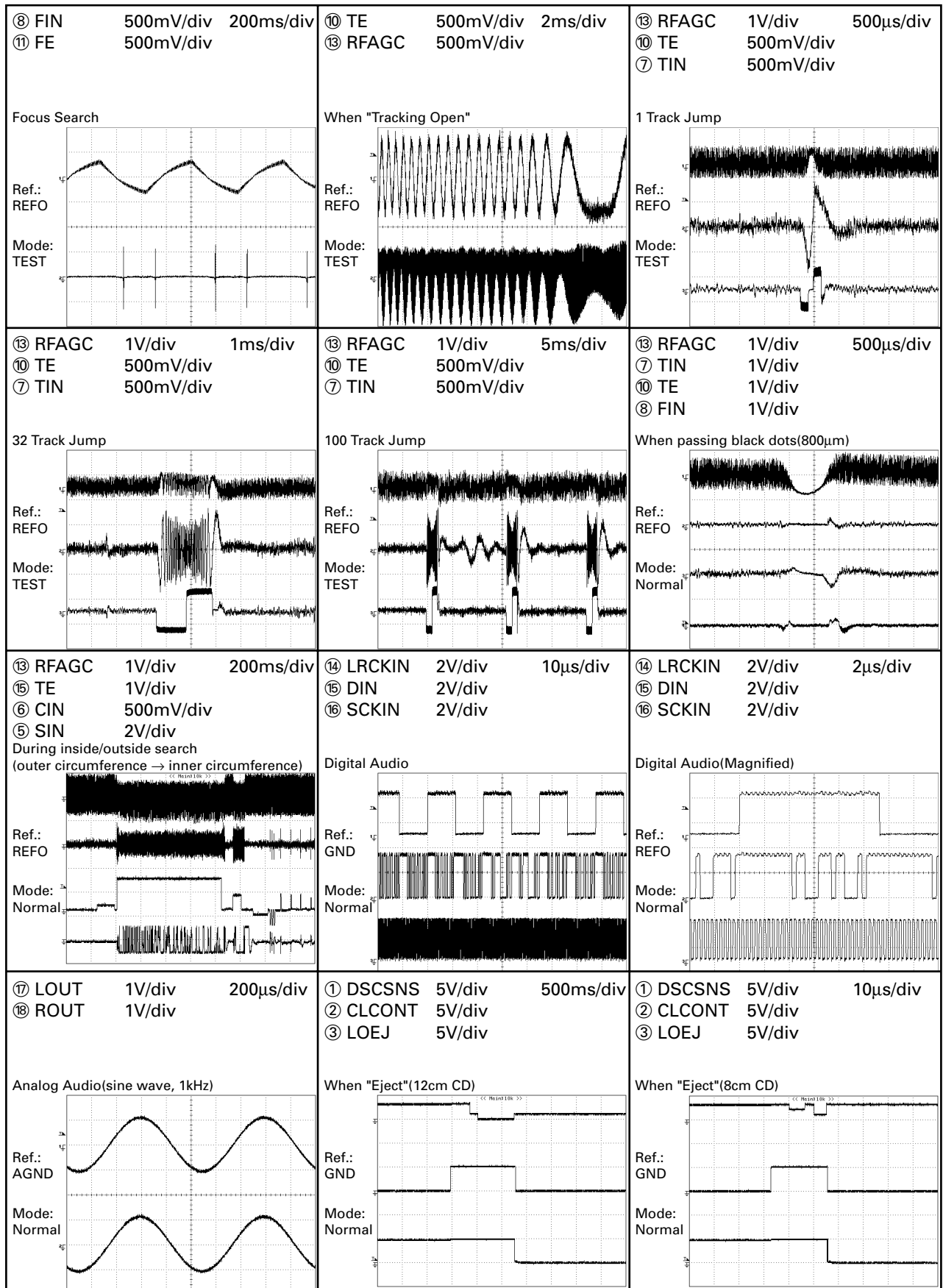
B

C

Waveforms

Note : 1. The encircled numbers denote measuring points in the circuit diagram.
2. Reference voltage REFO1(1.65V)

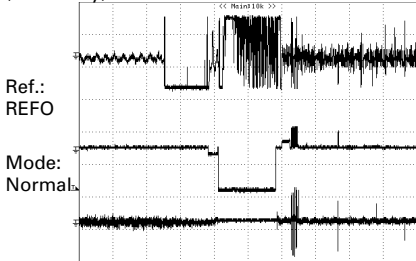




A

⑤ SIN 1V/div 500ms/div
⑥ CIN 500mV/div
⑦ TIN 500mV/div

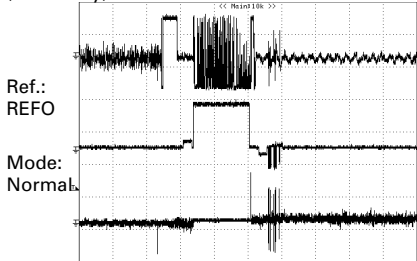
When switching to CD-ROM from CD-DA
(BAND key)



B

⑤ SIN 1V/div 500ms/div
⑥ CIN 500mV/div
⑦ TIN 500mV/div

When switching to CD-DA from CD-ROM
(BAND key)



C

D

E

F



5



6



7



8



A



B



C



D



E



F



5



6



7



8



A

A TUNER AMP UNIT

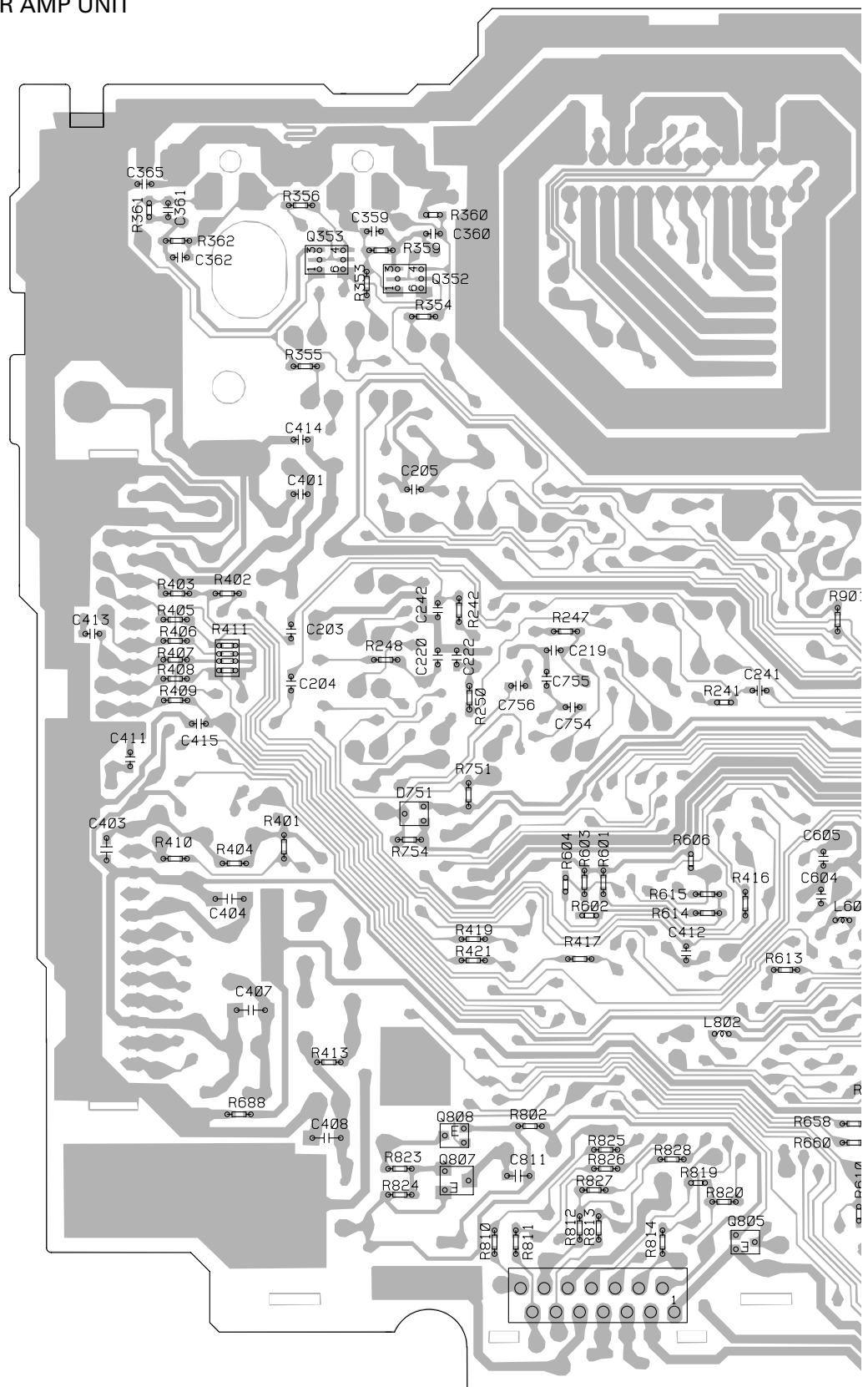
B

C

D

E

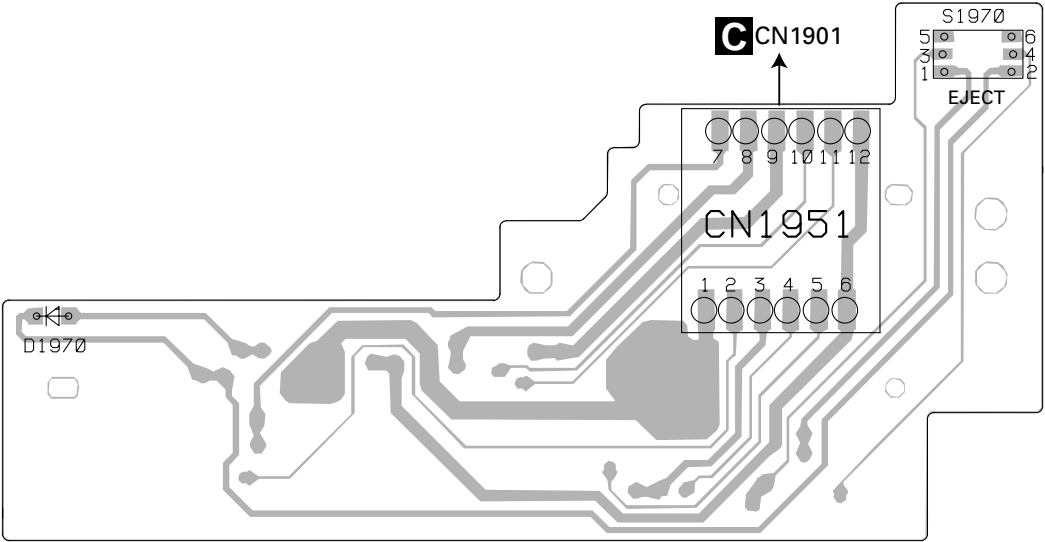
F


A

4.2 PANEL UNIT

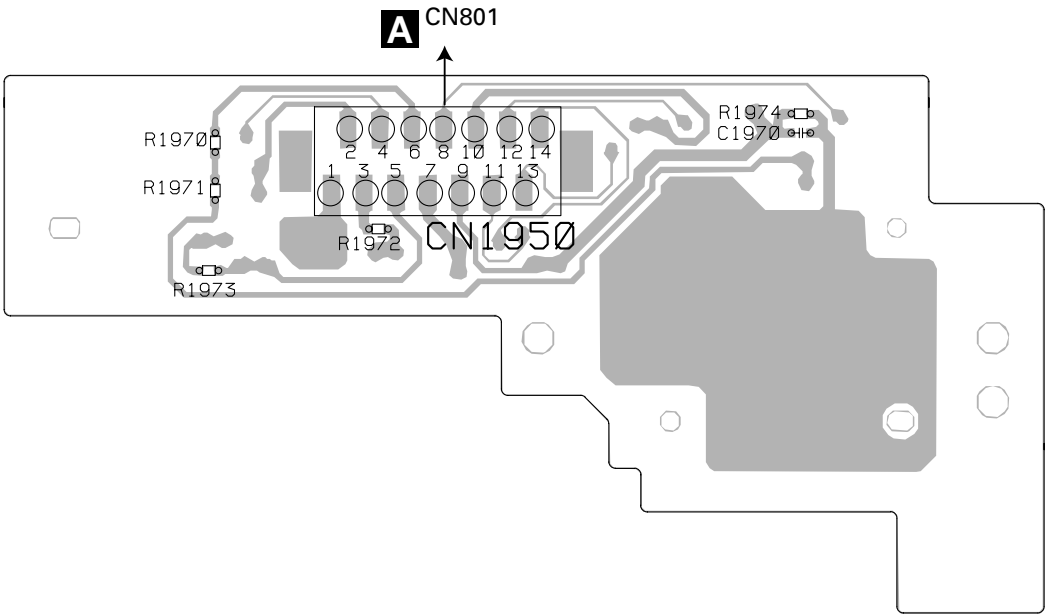
B PANEL UNIT

SIDE A



B PANEL UNIT

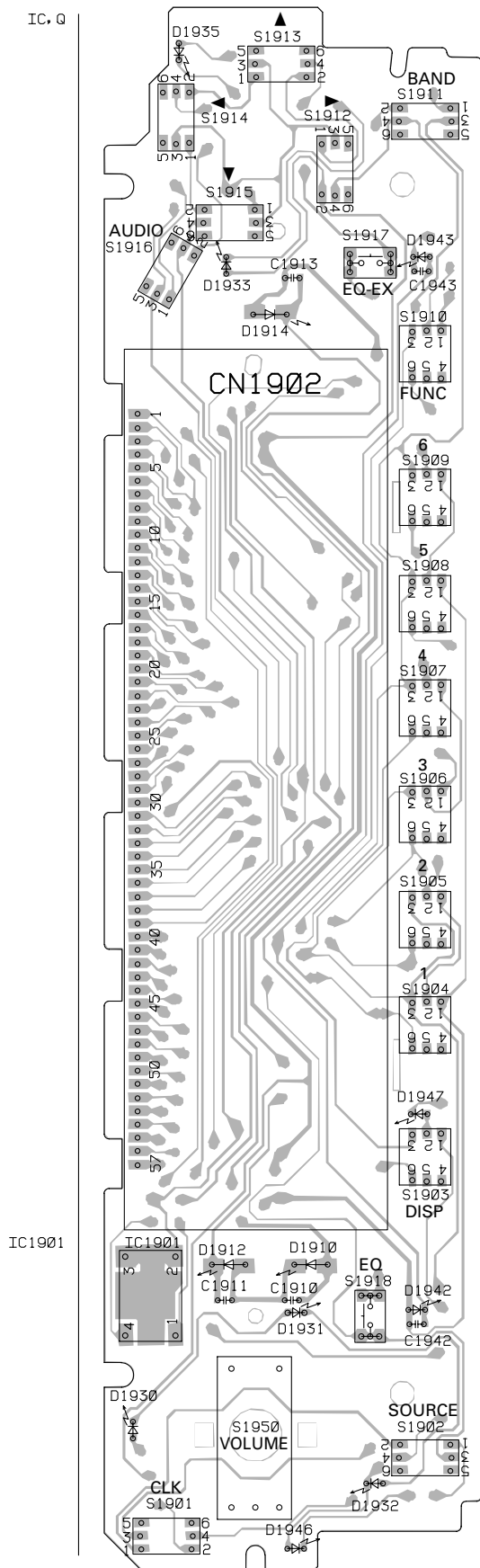
SIDE B



4.3 KEYBOARD UNIT

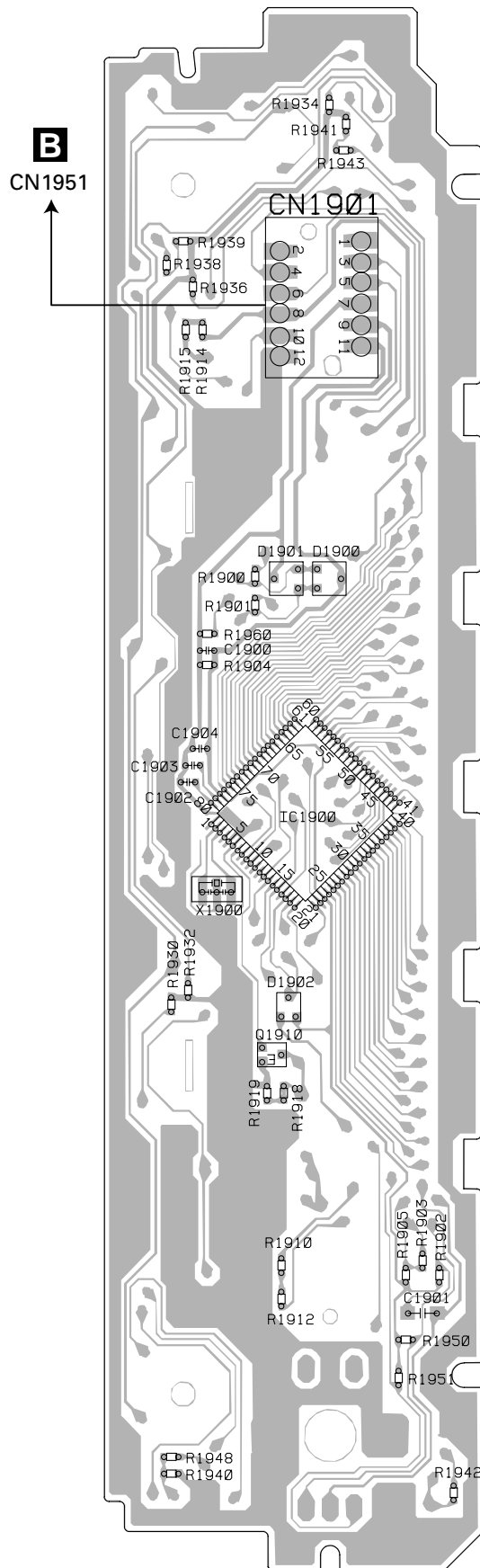
C KEYBOARD UNIT

SIDE A



C KEYBOARD UNIT

SIDE B



4.4 CD MECHANISM MODULE

D CD CORE UNIT(S10MP3)

SIDE A

A

B

C

D

E

F

IC, Q

IC502

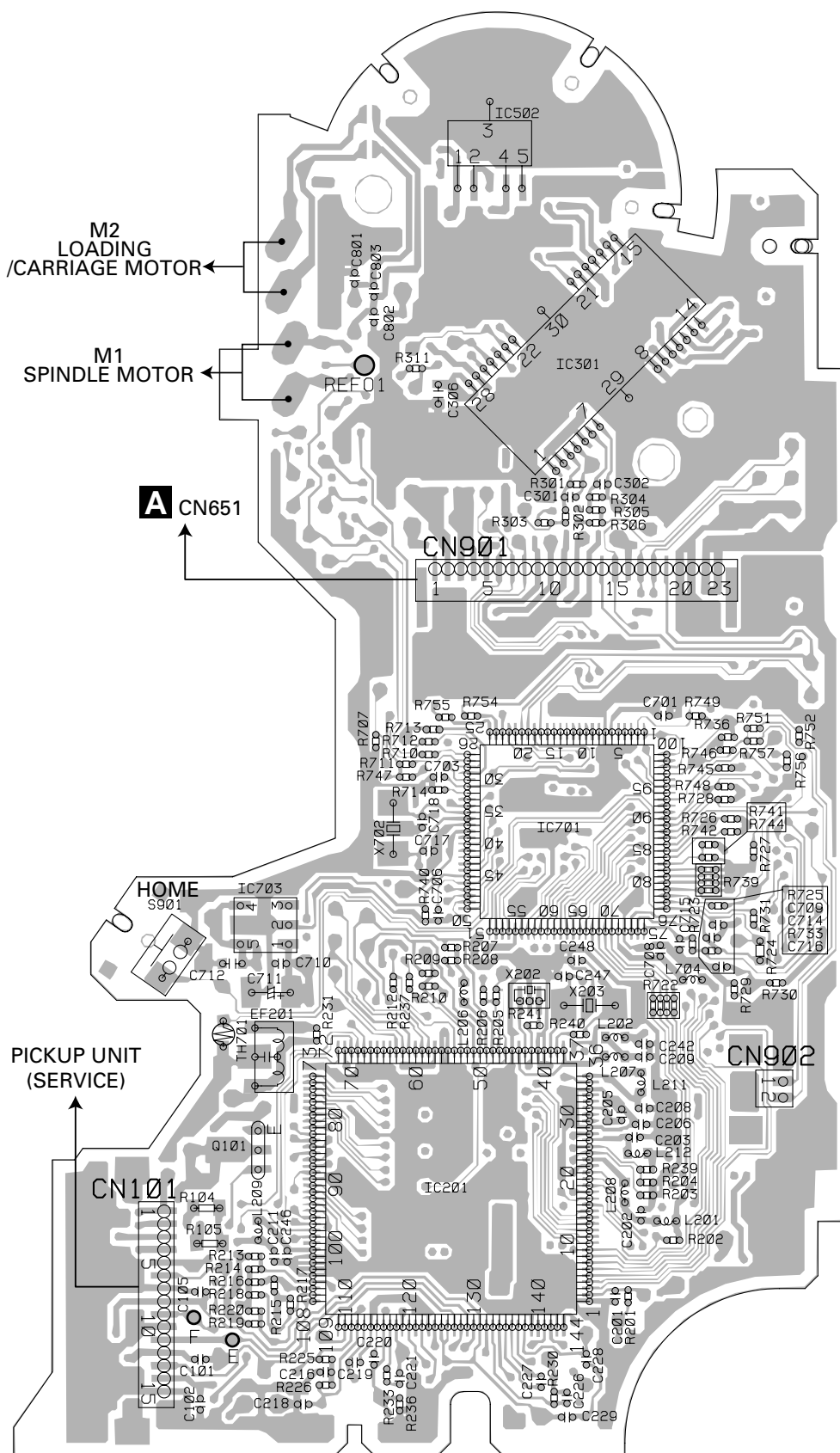
IC301

IC701

IC703

Q101

IC201



D

5. ELECTRICAL PARTS LIST

NOTES:

- Parts whose parts numbers are omitted are subject to being not supplied.
- The part numbers shown below indicate chip components.

Chip Resistor

RS1/○S○○○○J,RS1/○○S○○○J

Chip Capacitor (except for CQS.....)

CKS....., CCS....., CSZS.....

====Circuit Symbol and No.====Part Name	Part No.	====Circuit Symbol and No.====Part Name	Part No.
A Unit Number : CWM8588(DEH-P550MP/XN/UC) Unit Name : Tuner Amp Unit		D 808 Diode	HZS11L(A1)
MISCELLANEOUS		D 911 Diode	S5688G
IC 101 IC	HA12187FP	D 912 Diode	HZS6L(B2)
IC 131 IC	NJM4558MD	D 921 Diode	HZS9L(B3)
IC 201 IC	PML009A	D 931 Diode	HZS7L(A1)
IC 301 IC	PAL007A	D 932 Diode	HZS7L(C3)
IC 401 IC	NJM2391DL1-33	D 937 Diode	MA110
IC 601 IC	PD5800A	D 951 Diode	DAN202U
IC 602 IC	S-80835ANUP-EDZ	D 981 Diode	DAN202U
Q 101 Transistor	2SA1037K	D 982 Diode	HZS9L(A2)
Q 102 Transistor	DTC114EU	L 101 Inductor	LAU2R2K
Q 301 Transistor	DTC124EU	L 201 Ferri-Inductor	LAU4R7K
Q 351 Transistor	IMH3A	L 301 Choke Coil 600μH	CTH1280
Q 352 Transistor	IMH3A	L 401 Ferri-Inductor	LAU4R7K
Q 353 Transistor	IMH3A	L 403 Inductor	LAU1R0K
Q 650 Transistor	2SD1760F5	L 404 Inductor	LAU1R0K
Q 651 Transistor	2SD2396	L 406 Inductor	CTF1385
Q 652 Transistor	IMD2A	L 601 Ferri-Inductor	LAU100K
Q 803 Transistor	2SD1767	L 683 Ferri-Inductor	LAU4R7K
Q 804 Transistor	IMD2A	L 801 Inductor	LAU2R2K
Q 805 Transistor	DTC143EU	L 951 Inductor	LAU2R2K
Q 806 Transistor	IMD14	X 601 Radiator 10.00MHz	CSS1599
Q 807 Transistor	2SA1037K	S 802 Switch(DSENSE)	CSN1039
Q 808 Transistor	DTC114EU	FM/AM Tuner Unit	CWE1646
Q 911 Transistor	2SD2396	Fuse 10A	CEK1208
Q 913 Transistor	IMD2A	BZ 641 Buzzer	CPV1062
Q 921 Transistor	2SD2396	AR 401 Surge Protector	DSP-201M-S00B
Q 922 Transistor	DTC114EU	RESISTORS	
Q 923 Transistor	2SB1243	R 101	RS1/16S101J
Q 931 Transistor	IMX1	R 102	RS1/16S620J
Q 932 Transistor	DTC114EU	R 103	RS1/16S101J
Q 951 Transistor	2SA1037K	R 104	RS1/16S222J
Q 981 Transistor	2SC2412K	R 105	RS1/16S103J
Q 982 Transistor	IMD2A	R 106	RS1/16S472J
D 131 Diode Network	DA204U	R 107	RS1/16S223J
D 132 Diode Network	DA204U	R 108	RS1/16S472J
D 133 Diode	DAN202U	R 109	RS1/16S821J
D 134 Diode	DAP202U	R 110	RS1/16S821J
D 301 Diode	S5688G	R 111	RS1/16S223J
D 302 Diode	S5688G	R 112	RS1/16S223J
D 303 Diode	S5688G	R 113	RS1/16S102J
D 304 Diode	S5688G	R 114	RS1/16S102J
D 401 Diode	S5688G	R 133	RS1/16S563J
D 402 Diode	S5688G	R 134	RS1/16S104J
D 403 Diode	S5688G	R 139	RS1/16S563J
D 650 Diode	HZS6L(C1)	R 140	RS1/16S104J
D 651 Diode	HZS9L(B1)	R 147	RS1/16S474J
D 803 Diode Network	DA204U	R 148	RS1/16S474J
D 804 Diode	DAN202U	R 201	RAB4C102J
D 805 Diode	DAP202U	R 241	RS1/16S102J
D 806 Diode	DAN202U	R 242	RS1/16S102J
D 807 Diode	DAP202U	R 247	RS1/16S101J
		R 248	RS1/16S101J

====Circuit Symbol and No.==Part Name	Part No.	====Circuit Symbol and No.==Part Name	Part No.	
R 249	RS1/16S101J	R 803	RS1/16S472J	A
R 250	RS1/16S101J	R 804	RS1/16S1R0J	
R 301	RS1/16S103J	R 805	RS1/16S391J	
R 302	RS1/16S103J	R 806	RS1/16S391J	
R 303	RS1/16S153J	R 807	RS1/16S473J	
R 304	RS1/16S331J	R 808	RS1/16S473J	
R 351	RS1/16S821J	R 809	RS1/16S102J	
R 352	RS1/16S821J	R 810	RS1/16S222J	
R 353	RS1/16S821J	R 811	RS1/16S222J	
R 354	RS1/16S821J	R 812	RS1/16S222J	
R 355	RS1/16S821J	R 813	RS1/16S222J	B
R 356	RS1/16S821J	R 814	RS1/16S222J	
R 357	RS1/16S223J	R 815	RS1/16S473J	
R 358	RS1/16S223J	R 816	RS1/16S104J	
R 359	RS1/16S223J	R 817	RD1/4PU391J	
R 360	RS1/16S223J	R 818	RS1/16S104J	
R 361	RS1/16S223J	R 819	RS1/16S222J	
R 362	RS1/16S223J	R 820	RS1/16S222J	
R 403	RS1/16S681J	R 821	RS1/16S472J	
R 404	RS1/16S0R0J	R 822	RS1/16S0R0J	
R 405	RS1/16S681J	R 823	RS1/16S102J	
R 406	RS1/16S681J	R 824	RS1/16S473J	
R 407	RS1/16S681J	R 825	RS1/16S102J	
R 408	RS1/16S681J	R 826	RS1/16S102J	
R 410	RS1/16S681J	R 827	RS1/16S102J	
R 413	RS1/16S0R0J	R 828	RS1/16S102J	C
R 416	RS1/16S681J	R 903	RS1/16S223J	
R 417	RS1/16S681J	R 912	RS1/16S222J	
R 419	RS1/16S681J	R 913	RS1/16S223J	
R 421	RS1/16S681J	R 914	RS1/16S104J	
R 423	RD1/4PU0R0J	R 915	RS1/16S104J	
R 602	RS1/16S104J	R 916	RS1/16S104J	
R 605	RS1/16S0R0J	R 923	RS1/16S103J	
R 606	RS1/16S104J	R 924	RD1/4PU122J	
R 607	RS1/16S822J	R 925	RS1/16S182J	
R 608	RS1/16S221J	R 931	RS1/16S472J	
R 609	RS1/16S221J	R 932	RS1/16S473J	
R 610	RS1/16S682J	R 933	RS1/16S103J	
R 611	RS1/16S682J	R 934	RS1/16S473J	
R 612	RS1/16S104J	R 935	RS1/16S104J	
R 613	RS1/16S102J	R 936	RS1/16S103J	D
R 615	RS1/16S0R0J	R 938	RD1/4PU102J	
R 616	RS1/16S473J	R 939	RD1/4PU102J	
R 617	RS1/16S102J	R 951	RD1/4PU153J	
R 618	RS1/16S104J	R 952	RS1/16S472J	
R 630	RS1/16S104J	R 953	RS1/16S472J	
R 632	RS1/16S104J	R 954	RS1/16S102J	
R 641	RS1/16S102J	R 983	RS1/16S223J	
R 645	RS1/16S271J	R 984	RS1/16S473J	
R 651	RD1/4PU221J	R 985	RS1/16S102J	
R 652	RD1/4PU221J	CAPACITORS		
R 656	RS1/16S102J	C 101	CKSRYB104K16	
R 657	RS1/16S102J	C 102	CKSRYB473K25	
R 665	RD1/4PU0R0J	C 131	CKSRYB104K16	
R 666	RS1/16S0R0J	C 132	CKSRYB104K16	
R 669	RS1/16S0R0J	C 141	CKSRYB104K16	E
R 671	RS1/16S0R0J			
R 672	RS1/16S0R0J	C 142	CKSRYB103K50	
R 676	RS1/16S102J	C 143	CKSRYB474K10	
R 677	RS1/16S104J	C 144	CKSRYB474K10	
R 678	RS1/16S102J	C 145	CCSRCH101J50	
R 680	RS1/16S222J	C 146	CCSRCH101J50	
R 681	RS1/16S104J	C 147	CKSRYB104K16	
R 689	RS1/16S0R0J	C 201	CEJQ1R0M50	
R 802	RS1/16S222J	C 202	CEJQ1R0M50	
		C 203	CKSRYB104K16	F
		C 204	CKSRYB104K16	

A	====Circuit Symbol and No.==Part Name		Part No.	====Circuit Symbol and No.==Part Name		Part No.
	C	205	CKSRYB104K16	C	655	CKSRYB152K50
	C	206	CEJQ470M16	C	657	CCSRCH470J50
	C	207	CEJQ1R0M50	C	658	CCH1183
	C	208	CEJQ1R0M50	C	662	CCSRCH471J50
	C	209	CEJQ1R0M50	C	755	CKSRYB104K16
	C	210	CEJQ1R0M50	C	806	CKSRYB473K25
	C	211	CEJQ4R7M35	C	807	CKSRYB473K25
	C	212	CEJQ4R7M35	C	811	CKSQYB105K16
	C	213	CEJQ4R7M35	C	854	CKSRYB473K25
	C	214	CEJQ4R7M35	C	911	CCH1331
B	C	215	CEJQ4R7M35	C	912	CKSRYB472K50
	C	216	CEJQ4R7M35	C	913	CKSRYB103K50
	C	217	CEJQ4R7M35	C	914	CEJQ470M10
	C	218	CEJQ4R7M35	C	921	CEJQ221M10
	C	219	CCSRCH120J50	C	922	CKSRYB103K50
	C	220	CCSRCH120J50	C	923	CEJQ101M16
	C	221	CCSRCH120J50	C	931	CEJQ1R0M50
	C	222	CCSRCH120J50	A Unit Number : CWM8589(DEH-P5500MP/XN/UC) Unit Name : Tuner Amp Unit		
	C	225	CEJQ100M16			
	C	241	CKSRYB152K50	MISCELLANEOUS		
	C	242	CKSRYB152K50			
	C	301	CKSRYB104K16	IC	101	IC
	C	306	CEJQ330M10	IC	131	IC
	C	307	CCH1486	IC	201	IC
	C	309	CKSRYB104K16	IC	301	IC
C	C	310	CEJQ100M16	IC	401	IC
	C	311	CKSYB475K16	HA12187FP NJM4558MD PML009A PAL007A NJM2391DL1-33 PD5800A S-80835ANUP-EDZ 2SA1037K DTC114EU DTC124EU IMH3A IMH3A 2SD1760F5 2SD2396 IMD2A 2SD1767 IMD2A DTC143EU IMD14 2SA1037K DTC114EU 2SD2396 IMD2A 2SD2396 DTC114EU 2SB1243 IMX1 DTC114EU 2SA1037K 2SC2412K IMD2A DA204U DA204U DAN202U DAP202U S5688G S5688G S5688G S5688G S5688G S5688G S5688G HZS6L(C1) HZS9L(B1) DA204U		
	C	312	CKSYB475K16			
	C	317	CKSRYB474K10			
	C	318	CKSRYB474K10			
	C	319	CKSRYB474K10	IC	601	IC
	C	320	CKSRYB474K10	IC	602	IC
	C	321	CKSRYB474K10	Q	101	Transistor
	C	322	CKSRYB474K10	Q	102	Transistor
	C	323	CKSRYB474K10	Q	301	Transistor
	C	324	CKSRYB474K10	Q	352	Transistor
	C	325	CKSQYB225K10	Q	353	Transistor
	C	326	CKSQYB225K10	Q	650	Transistor
	C	351	CEJQ4R7M35	Q	651	Transistor
	C	352	CEJQ4R7M35	Q	652	Transistor
D	C	353	CEJQ4R7M35	Q	803	Transistor
	C	354	CEJQ4R7M35	Q	804	Transistor
	C	355	CEJQ4R7M35	Q	805	Transistor
	C	356	CEJQ4R7M35	Q	806	Transistor
	C	401	CKSRYB103K50	Q	807	Transistor
	C	402	CEJQ101M10	Q	808	Transistor
	C	403	CKSQYB105K16	Q	911	Transistor
	C	404	CKSYB475K10	Q	913	Transistor
	C	406	CEJQ470M10	Q	921	Transistor
	C	408	CKSYB475K10	Q	922	Transistor
	C	409	CEJQ1R0M50	Q	923	Transistor
	C	411	CCSRCH101J50	Q	931	Transistor
	C	412	CCSRCH470J50	Q	932	Transistor
	C	601	CEJQ4R7M35	Q	951	Transistor
	C	602	CKSQYB105K16	Q	981	Transistor
E	C	603	CEJQ2R2M50	Q	982	Transistor
	C	604	CCSRCH200J50	D	131	Diode Network
	C	605	CCSRCH200J50	D	132	Diode Network
	C	609	CCSRCH101J50	D	133	Diode
	C	644	CEJQ101M10	D	134	Diode
	C	645	CKSRYB473K25	D	301	Diode
	C	646	CCSRCH470J50	D	302	Diode
	C	651	CEJQ101M10	D	303	Diode
	C	652	CKSRYB473K25	D	304	Diode
	C	654	CKSRYB152K50	D	401	Diode
F				D	402	Diode
				D	403	Diode
				D	650	Diode
				D	651	Diode
				D	803	Diode Network

====Circuit Symbol and No.==Part Name			Part No.	====Circuit Symbol and No.==Part Name			Part No.	A
D	804	Diode	DAN202U	R	359		RS1/16S223J	
D	805	Diode	DAP202U	R	360		RS1/16S223J	
D	806	Diode	DAN202U	R	361		RS1/16S223J	
D	807	Diode	DAP202U	R	362		RS1/16S223J	
D	808	Diode	HZS11L(A1)	R	403		RS1/16S681J	
D	911	Diode	S5688G	R	404		RS1/16S0R0J	
D	912	Diode	HZS6L(B2)	R	405		RS1/16S681J	
D	921	Diode	HZS9L(B3)	R	406		RS1/16S681J	
D	931	Diode	HZS7L(A1)	R	407		RS1/16S681J	
D	932	Diode	HZS7L(C3)	R	408		RS1/16S681J	
D	937	Diode	MA110	R	410		RS1/16S681J	
D	951	Diode	DAN202U	R	413		RS1/16S0R0J	
D	981	Diode	DAN202U	R	416		RS1/16S681J	
D	982	Diode	HZS9L(A2)	R	417		RS1/16S681J	
L	101	Inductor	LAU2R2K	R	419		RS1/16S681J	
L	201	Ferri-Inductor	LAU4R7K	R	421		RS1/16S681J	
L	301	Choke Coil 600μH	CTH1280	R	423		RD1/4PU0R0J	
L	401	Ferri-Inductor	LAU4R7K	R	601	(DEH-P5550MP/XN/ES)	RS1/16S104J	
L	403	Inductor	LAU1R0K	R	602	(DEH-P5500MP/XN/UC)	RS1/16S104J	
L	404	Inductor	LAU1R0K	R	605		RS1/16S0R0J	
L	406	Inductor	CTF1385	R	606		RS1/16S104J	
L	601	Ferri-Inductor	LAU100K	R	607		RS1/16S822J	
L	683	Ferri-Inductor	LAU4R7K	R	608		RS1/16S221J	
L	801	Inductor	LAU2R2K	R	609		RS1/16S221J	
L	951	Inductor	LAU2R2K	R	610		RS1/16S682J	
X	601	Radiator 10.00MHz	CSS1599	R	611		RS1/16S682J	
S	802	Switch(DSENSE)	CSN1039	R	612		RS1/16S104J	
		Fuse 10A	CEK1208	R	613		RS1/16S102J	
		FM/AM Tuner Unit	CWE1646	R	615		RS1/16S0R0J	
BZ	641	Buzzer	CPV1062	R	616		RS1/16S473J	
AR	401	Surge Protector	DSP-201M-S00B	R	617		RS1/16S102J	
RESISTORS				R	618		RS1/16S104J	
				R	630		RS1/16S104J	
R	101		RS1/16S101J	R	632		RS1/16S104J	
R	102		RS1/16S620J	R	641		RS1/16S102J	
R	103		RS1/16S101J	R	645		RS1/16S271J	
R	104		RS1/16S222J	R	651		RD1/4PU221J	
R	105		RS1/16S103J	R	652		RD1/4PU221J	
				R	656		RS1/16S102J	
R	106		RS1/16S472J	R	657		RS1/16S102J	
R	107		RS1/16S223J					
R	108		RS1/16S472J	R	665		RD1/4PU0R0J	
R	109		RS1/16S821J	R	666		RS1/16S0R0J	
R	110		RS1/16S821J	R	669		RS1/16S0R0J	
				R	671		RS1/16S0R0J	
R	111		RS1/16S223J	R	672		RS1/16S0R0J	
R	112		RS1/16S223J					
R	113		RS1/16S102J	R	676		RS1/16S102J	
R	114		RS1/16S102J	R	677		RS1/16S104J	
R	133		RS1/16S563J	R	678		RS1/16S102J	
				R	680		RS1/16S222J	
R	134		RS1/16S104J	R	681		RS1/16S104J	
R	139		RS1/16S563J					
R	140		RS1/16S104J	R	689		RS1/16S0R0J	
R	147		RS1/16S474J	R	802		RS1/16S222J	
R	148		RS1/16S474J	R	803		RS1/16S472J	
				R	804		RS1/16S1R0J	
R	201		RAB4C102J	R	805		RS1/16S391J	
R	241		RS1/16S102J					
R	242		RS1/16S102J	R	806		RS1/16S391J	
R	247		RS1/16S101J	R	807		RS1/16S473J	
R	248		RS1/16S101J	R	808		RS1/16S473J	
				R	809		RS1/16S102J	
R	249		RS1/16S101J	R	810		RS1/16S222J	
R	250		RS1/16S101J					
R	301		RS1/16S103J	R	811		RS1/16S222J	
R	302		RS1/16S103J	R	812		RS1/16S222J	
R	303		RS1/16S153J	R	813		RS1/16S222J	
				R	814		RS1/16S222J	
R	304		RS1/16S331J	R	815		RS1/16S473J	
R	353		RS1/16S821J					
R	354		RS1/16S821J					
R	355		RS1/16S821J					
R	356		RS1/16S821J					

A	====Circuit Symbol and No.==Part Name		Part No.	====Circuit Symbol and No.==Part Name		Part No.
	R	816	RS1/16S104J	C	220	CCSRCH120J50
	R	817	RD1/4PU391J	C	221	CCSRCH120J50
	R	818	RS1/16S104J	C	222	CCSRCH120J50
	R	819	RS1/16S222J	C	225	CEJQ100M16
	R	820	RS1/16S222J	C	241	CKSRYB152K50
	R	821	RS1/16S472J	C	242	CKSRYB152K50
	R	822	RS1/16S0R0J	C	301	CKSRYB104K16
	R	823	RS1/16S102J	C	306	CEJQ330M10
	R	824	RS1/16S473J	C	307	CCH1486
	R	825	RS1/16S102J	C	309	CKSRYB104K16
B	R	826	RS1/16S102J	C	310	CEJQ100M16
	R	827	RS1/16S102J	C	311	CKSYB475K16
	R	828	RS1/16S102J	C	312	CKSYB475K16
	R	903	RS1/16S223J	C	317	CKSRYB474K10
	R	912	RS1/16S222J	C	318	CKSRYB474K10
	R	913	RS1/16S223J	C	319	CKSRYB474K10
	R	914	RS1/16S104J	C	320	CKSRYB474K10
	R	915	RS1/16S104J	C	321	CKSRYB474K10
	R	916	RS1/16S104J	C	322	CKSRYB474K10
	R	923	RS1/16S103J	C	323	CKSRYB474K10
	R	924	RD1/4PU122J	C	324	CKSRYB474K10
	R	925	RS1/16S182J	C	325	CKSQYB225K10
	R	931	RS1/16S472J	C	326	CKSQYB225K10
	R	932	RS1/16S473J	C	353	CEJQ4R7M35
	R	933	RS1/16S103J	C	354	CEJQ4R7M35
C	R	934	RS1/16S473J	C	355	CEJQ4R7M35
	R	935	RS1/16S104J	C	356	CEJQ4R7M35
	R	936	RS1/16S103J	C	401	CKSRYB103K50
	R	938	RD1/4PU102J	C	402	CEJQ101M10
	R	939	RD1/4PU102J	C	403	CKSQYB105K16
	R	951	RD1/4PU153J	C	404	CKSYB475K10
	R	952	RS1/16S472J	C	406	CEJQ470M10
	R	953	RS1/16S472J	C	408	CKSYB475K10
	R	954	RS1/16S102J	C	409	CEJQ1R0M50
	R	983	RS1/16S223J	C	411	CCSRCH101J50
	R	984	RS1/16S473J	C	412	CCSRCH470J50
	R	985	RS1/16S102J	C	601	CEJQ4R7M35
				C	602	CKSQYB105K16
				C	603	CEJQ2R2M50
				C	604	CCSRCH200J50
CAPACITORS						
D	C	101	CKSRYB104K16	C	605	CCSRCH200J50
	C	102	CKSRYB473K25	C	609	CCSRCH101J50
	C	131	CKSRYB104K16	C	644	CEJQ101M10
	C	132	CKSRYB104K16	C	645	CKSRYB473K25
	C	141	CKSRYB104K16	C	646	CCSRCH470J50
	C	142	CKSRYB103K50	C	651	CEJQ101M10
	C	143	CKSRYB474K10	C	652	CKSRYB473K25
	C	144	CKSRYB474K10	C	654	CKSRYB152K50
	C	145	CCSRCH101J50	C	655	CKSRYB152K50
	C	146	CCSRCH101J50	C	657	CCSRCH470J50
	C	147	CKSRYB104K16	C	658	CCH1183
	C	201	CEJQ1R0M50	C	662	CCSRCH471J50
	C	202	CEJQ1R0M50	C	755	CKSRYB104K16
	C	203	CKSRYB104K16	C	806	CKSRYB473K25
	C	204	CKSRYB104K16	C	807	CKSRYB473K25
E	C	205	CKSRYB104K16	C	811	CKSQYB105K16
	C	206	CEJQ470M16	C	854	CKSRYB473K25
	C	207	CEJQ1R0M50	C	911	CCH1331
	C	208	CEJQ1R0M50	C	912	CKSRYB472K50
	C	209	CEJQ1R0M50	C	913	CKSRYB103K50
	C	210	CEJQ1R0M50	C	914	CEJQ470M10
	C	211	CEJQ4R7M35	C	921	CEJQ221M10
	C	212	CEJQ4R7M35	C	922	CKSRYB103K50
	C	213	CEJQ4R7M35	C	923	CEJQ101M16
	C	214	CEJQ4R7M35	C	931	CEJQ1R0M50
F	C	215	CEJQ4R7M35			
	C	216	CEJQ4R7M35			
	C	217	CEJQ4R7M35			
	C	218	CEJQ4R7M35			
	C	219	CCSRCH120J50			

====Circuit Symbol and No.==Part Name

Part No.

Unit Number : CWM8605
Unit Name : Keyboard Unit

MISCELLANEOUS

IC	1900	IC	PD6294A
IC	1901	HIC Module	RS-140
Q	1910	Transistor	DTC114EU
D	1902	Diode Network	DA204U
D	1910	LED	NSSW440-9159

D	1912	LED	NSSW440-9159
D	1914	LED	NSSW440-9159
D	1930	LED	CL-195PG-CD
D	1931	LED	CL-195PG-CD
D	1932	LED	CL-195PG-CD

D	1935	LED	CL-195PG-CD
D	1942	LED	CL190UBX
D	1943	LED	CL190UBX
D	1946	LED	CL-195PG-CD
D	1947	LED	CL-195PG-CD

X	1900	Ceramic Resonator 5.00MHz	CSS1547
S	1901	Push Switch	CSG1112
S	1902	Push Switch	CSG1112
S	1903	Switch	CSG1107
S	1904	Switch	CSG1107

S	1905	Switch	CSG1107
S	1906	Switch	CSG1107
S	1907	Switch	CSG1107
S	1908	Switch	CSG1107
S	1909	Switch	CSG1107

S	1910	Switch	CSG1107
S	1911	Push Switch	CSG1112
S	1912	Push Switch	CSG1160
S	1913	Push Switch	CSG1112
S	1914	Push Switch	CSG1160

S	1915	Push Switch	CSG1112
S	1916	Push Switch	CSG1112
S	1917	Push Switch	CSG1111
S	1918	Push Switch	CSG1111
S	1950	Encoder	CSD1059

LCD	CAW1755
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RESISTORS

R	1900	RS1/16S222J
R	1901	RS1/16S222J
R	1902	RS1/16S121J
R	1903	RS1/16S2R2J
R	1910	RS1/16S101J

R	1912	RS1/16S680J
R	1914	RS1/16S181J
R	1915	RS1/16S181J
R	1919	RS1/16S101J
R	1930	RS1/16S560J

R	1932	RS1/16S560J
R	1934	RS1/16S560J
R	1936	RS1/16S560J
R	1938	RS1/16S330J
R	1939	RS1/16S680J

R	1940	RS1/16S560J
R	1941	RS1/16S151J
R	1942	RS1/16S0R0J
R	1943	RS1/16S151J
R	1950	RS1/16S472J

R	1960	RS1/16S473J
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====Circuit Symbol and No.==Part Name

Part No.

CAPACITORS

C	1900	CKSRYB104K16
C	1901	CKSYF106Z10
C	1902	CKSRYB104K16
C	1903	CKSRYB104K16
C	1904	CKSRYB104K16

C	1910	CKSRYF104Z25
C	1911	CKSRYF104Z25
C	1913	CKSRYF104Z25
C	1942	CKSRYF104Z25
C	1943	CKSRYF104Z25

Unit Number : CWM8758
Unit Name : Panel Unit

MISCELLANEOUS

D	1970	LED	CL220PGC
S	1970	Push Switch(EJECT)	CSG1112

RESISTORS

R	1970	RS1/16S101J
R	1971	RS1/16S101J
R	1972	RS1/16S0R0J

CAPACITORS

C	1970	CKSRYB104K16
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Unit Number : CWX2743
Unit Name : CD Core Unit(S10MP3)

MISCELLANEOUS

IC	201	IC	UPD63760GJ
IC	202	IC	MSM51V4265EP-70TS
IC	203	IC	BA033SFP
IC	301	IC	BA5996FM
IC	501	IC	UPD61002GC

IC	502	IC	BA25BC0WFP
IC	701	IC	PE5352B
IC	702	IC	TC74VHC08AFT
IC	703	IC	S-818A33AUC-BGN
Q	101	Transistor	2SB1132

Q	601	Transistor	DTC323TK
Q	602	Transistor	DTC323TK
Q	603	Transistor	2SB709A
Q	701	Transistor	UN2111
D	101	Diode	1SS355

D	201	Diode	1SR154-400
D	501	Diode	1SR154-400
D	601	Diode	MA152WA
L	201	Inductor	CTF1386
L	202	Inductor	CTF1386

L	204	Inductor	CTF1386
L	205	Inductor	CTF1386
L	206	Inductor	CTF1386
L	207	Inductor	CTF1386
L	208	Inductor	CTF1386

L	209	Inductor	CTF1386
L	211	Inductor	CTF1386
L	212	Inductor	CTF1386
L	501	Inductor	CTF1386
L	502	Inductor	CTF1386

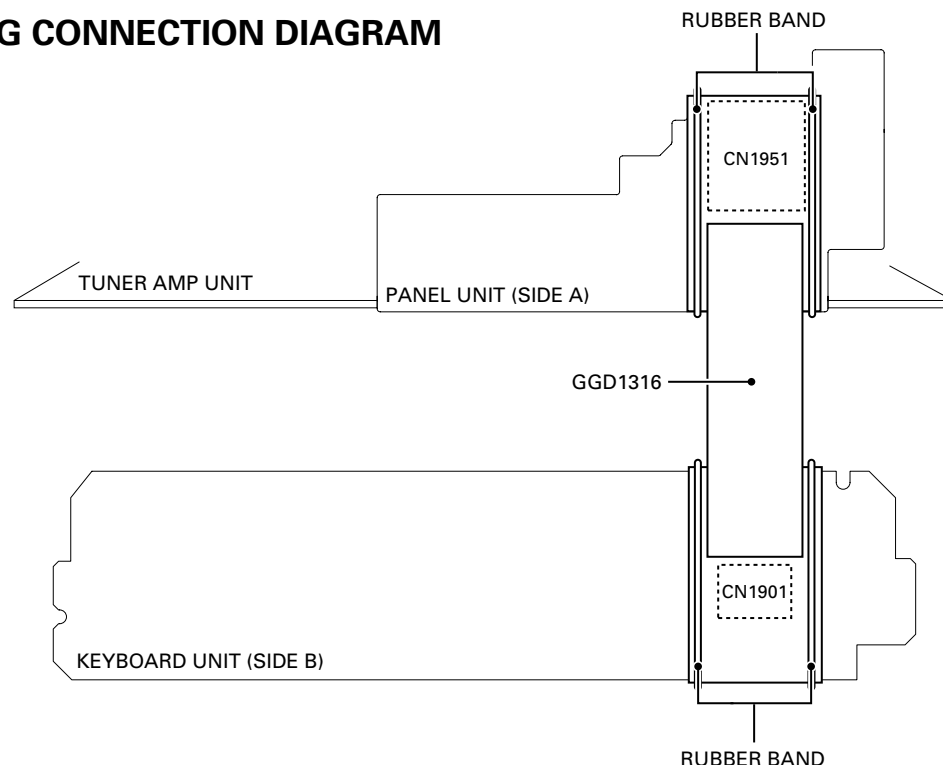
L	503	Inductor	CTF1386
L	701	Inductor	CTF1386
L	702	Inductor	LCYBR22J1608
L	703	Inductor	CTF1386
L	704	Inductor	CTF1386

A	====Circuit Symbol and No.==Part Name			Part No.	====Circuit Symbol and No.==Part Name			Part No.
	TH	701	Thermistor	CCX1037	R	508		RS1/16SS223J
	X	201	Ceramic Resonator 16.934MHz	CSS1603	R	509		RS1/16SS102J
	X	202	Ceramic Resonator 24.57MHz	CSS1615	R	510		RS1/16SS223J
	X	701	Ceramic Resonator 16.00MHz	CSS1616	R	511		RS1/16SS223J
	S	901	Switch(HOME)	CSN1051	R	512		RS1/16SS223J
	S	902	Switch(CLAMP)	CSN1051	R	601		RS1/16S101J
	S	903	Spring Switch(DSCSNS)	CSN1052	R	602		RS1/16S101J
	S	904	Switch(12EJ)	CSN1051	R	603		RS1/16S223J
	S	905	Switch(8EJ)	CSN1051	R	604		RS1/16S223J
					R	605		RS1/16SS103J
	RESISTORS				R	707		RS1/16SS0R0J
	R	101		RS1/10S1R5J	R	708		RS1/16SS102J
	R	102		RS1/10S1R5J	R	709		RS1/16SS102J
	R	103		RS1/10S1R5J	R	710		RS1/16SS102J
	R	104		RS1/10S1R5J	R	711		RS1/16SS102J
	R	105		RS1/10S1R5J				
	R	201		RS1/16SS102J	R	712		RS1/16SS102J
	R	202		RS1/16SS333J	R	713		RS1/16SS102J
	R	203		RS1/16SS333J	R	714		RS1/16SS473J
	R	204		RS1/16SS333J	R	715		RAB4CQ221J
	R	206		RS1/16SS0R0J	R	716		RAB4CQ221J
	R	208		RS1/16SS0R0J	R	717		RAB4CQ221J
	R	210		RS1/16SS0R0J	R	718		RAB4CQ221J
	R	212		RS1/16SS221J	R	719		RAB4CQ221J
	R	213		RS1/16SS1002D	R	720		RS1/16SS471J
	R	214		RS1/16SS1002D	R	721		RS1/16SS471J
	R	215		RS1/16SS6801D	R	722		RAB4CQ221J
	R	216		RS1/16SS6801D	R	723		RS1/16SS102J
	R	217		RS1/16SS1002D	R	724		RN1/16SE1302D
	R	218		RS1/16SS1002D	R	725		RS1/16SS222J
	R	219		RS1/16SS1002D	R	726		RS1/16SS103J
	R	220		RS1/16SS1002D	R	727		RS1/16SS473J
	R	221		RS1/16SS103J	R	728		RS1/16SS473J
	R	222		RS1/16SS103J	R	729		RS1/16SS223J
	R	223		RS1/16SS103J	R	730		RS1/16SS473J
	R	224		RS1/16SS103J	R	731		RS1/16SS104J
	R	225		RS1/16SS103J	R	732		RS1/16SS104J
	R	226		RS1/16SS393J	R	733		RS1/16SS104J
	R	227		RS1/16SS103J	R	737		RAB4CQ473J
	R	228		RS1/16SS182J	R	739		RAB4CQ473J
	R	229		RS1/16SS103J	R	740		RS1/16SS473J
	R	231		RS1/16SS0R0J	R	741		RS1/16SS104J
	R	232		RS1/16SS182J	R	742		RS1/16SS104J
	R	233		RS1/16SS0R0J	R	745		RS1/16SS473J
	R	237		RS1/16SS104J	R	746		RS1/16SS104J
	R	238		RS1/16SS473J	R	747		RS1/16SS104J
	R	240		RS1/16SS0R0J	R	748		RS1/16SS104J
	R	241		RS1/16SS221J	R	754		RS1/16SS102J
	R	301		RS1/16SS183J	R	755		RS1/16SS102J
	R	302		RS1/16SS822J	R	756		RS1/16SS104J
	R	303		RS1/16SS0R0J	R	801		RS1/16SS104J
	R	304		RS1/16SS183J	R	802		RS1/16SS473J
	R	305		RS1/16SS822J	R	803		RS1/16SS273J
	R	306		RS1/16SS0R0J	R	901		RS1/16SS221J
	R	307		RS1/16SS183J	R	902		RS1/16SS221J
	R	308		RS1/16SS822J	R	903		RS1/16SS221J
	R	309		RS1/16SS183J	R	904		RS1/16SS221J
	R	310		RS1/16SS822J	R	905		RS1/16SS221J
	R	311		RS1/16SS0R0J	R	906		RS1/16SS221J
	R	501		RS1/16SS221J	CAPACITORS			
	R	502		RS1/16SS221J	C	101		CKSSYB104K10
	R	503		RS1/16SS221J	C	102		CKSSYB104K10
	R	504		RAB4CQ223J	C	103		CEV101M16
	R	505		RAB4CQ223J	C	104		CEV101M4
	R	506		RAB4CQ223J	C	105		CKSSYB104K10
	R	507		RS1/16SS223J				

====Circuit Symbol and No.==Part Name	Part No.	====Circuit Symbol and No.==Part Name	Part No.	
C 106	CCSRCH101J50	C 707	CKSSYB104K10	A
C 108	CKSSYB104K10	C 708	CKSSYB104K10	
C 109	CEV100M16	C 709	CKSSYB103K16	
C 201	CKSSYB471K50	C 710	CKSSYB104K10	
C 202	CKSSYB104K10	C 711	10μF/10V CCH1349	
C 203	CKSSYB104K10	C 712	CKSRB224K16	
C 204	CEV220M6R3	C 713	CKSSYB104K10	
C 205	CKSSYB103K16	C 714	CKSSYB104K10	
C 206	CKSSYB103K16	C 715	CKSSYB103K16	
C 207	CEV221M4	C 716	CKSSYB103K16	
C 208	CKSSYB104K10	C 901	CKSSYB104K10	
C 209	CKSSYB104K10	C 903	CCSRCH101J50	
C 210	CKSSYB104K10	Miscellaneous Parts List		B
C 211	CKSSYB104K10			
C 216	CKSSYB332K50			
C 217	CKSSYB104K10	M 1	Pickup Unit(Service)(P10)	
C 218	CKSSYB223K16	M 2	Motor Unit(SPINDLE)	
C 219	CKSSYB104K10		Motor Unit(LOADING/CARRIAGE)	
C 220	CKSSYB103K16		CXX1641	
C 221	CKSSYB104K10		CXB6007	
C 222	CCSSCH270J50		CXB8933	
C 223	CCSSCJ3R0C50			
C 224	CKSSYB104K10			
C 225	CKSSYB103K16			
C 226	CCSSCH680J50			
C 227	CCSSCH470J50			C
C 228	CKSSYB682K25			
C 230	CKSSYB104K10			
C 232	CKSSYB104K10			
C 233	47μF/6.3V CCH1436			
C 234	CEV221M4			
C 235	CKSRB224K16			
C 237	CKSSYB104K10			
C 238	CKSSYB104K10			
C 239	CCSSCH9R0D50			
C 242	CKSSYB104K10			
C 243	CKSSYB104K10			
C 245	CKSSYB104K10			
C 246	CKSSYB104K10			
C 301	CKSSYB331K50			D
C 302	CKSSYB331K50			
C 303	CKSSYB472K25			
C 304	CKSSYB472K25			
C 305	CEV101M16			
C 306	CKSRB224K16			
C 501	CKSSYB104K10			
C 502	CKSSYB471K50			
C 503	CKSSYB104K10			
C 504	47μF/6.3V CCH1436			
C 505	CKSRB224K16			
C 506	CKSSYB104K10			
C 508	CKSSYB104K10			
C 509	CKSSYB104K10			E
C 510	CKSSYB104K10			
C 511	CKSSYB104K10			
C 601	CCSRCH102J50			
C 602	CCSRCH102J50			
C 603	4.7μF/25V CCH1508			
C 604	4.7μF/25V CCH1508			
C 701	CKSSYB104K10			
C 702	CKSSYB471K50			
C 703	CKSSYB103K16			
C 704	CEV1R0M50			
C 705	CKSSYB104K10			
C 706	CKSSYB471K50			F

6. ADJUSTMENT

6.1 JIG CONNECTION DIAGRAM



6.2 CD ADJUSTMENT

1) Cautions on adjustments

- In this product the single voltage (3.3V) is used for the regulator. The reference voltage is the REFO1 (1.65V) instead of the GND.

If you should mistakenly short the REFO1 with the GND during adjustment, accurate voltage will not be obtained, and the servo's misoperation will apply excessive shock to the pickup. To avoid such problems:

- a. Do not mix up the REFO1 with the GND when connecting the (-) probe of measuring instruments. Especially on an oscilloscope, avoid connecting the (-) probe for CH1 to the GND.

- b. In many cases, measuring instruments have the same potential as that for the (-) probe. Be sure to set the measuring instruments to the floating state.

- c. If you have mistakenly connected the REFO1 to the GND, turn off the regulator or the power immediately.

- Before mounting and removing filters or leads for adjustment, be sure to turn off the regulator.

- For stable circuit operation, keep the mechanism operating for about one minute or more after the regulator is turned on.

- In the test mode, any software protections will not work. Avoid applying any mechanical or electrical shock to the mechanism during adjustment.

- The RFI and RFO signals with a wide frequency range are easy to oscillate. When observing the signals, insert a resistor of 1k ohms in series.

- The load and eject operation is not guaranteed with the mechanism upside down. If the mechanism is blocked due to mistaken eject operation, reset the product or turn off and on the ACC to restore it.

2) Test mode

This mode is used to adjust the CD mechanism module.

- To enter the test mode.

While pressing the 4 and 6 keys at the same time, reset.

- To exit from the test mode.

Turn off the ACC and back up.

Notes:

- a. During ejection, do not press any other keys than the EJECT key until the loaded disc is ejected.

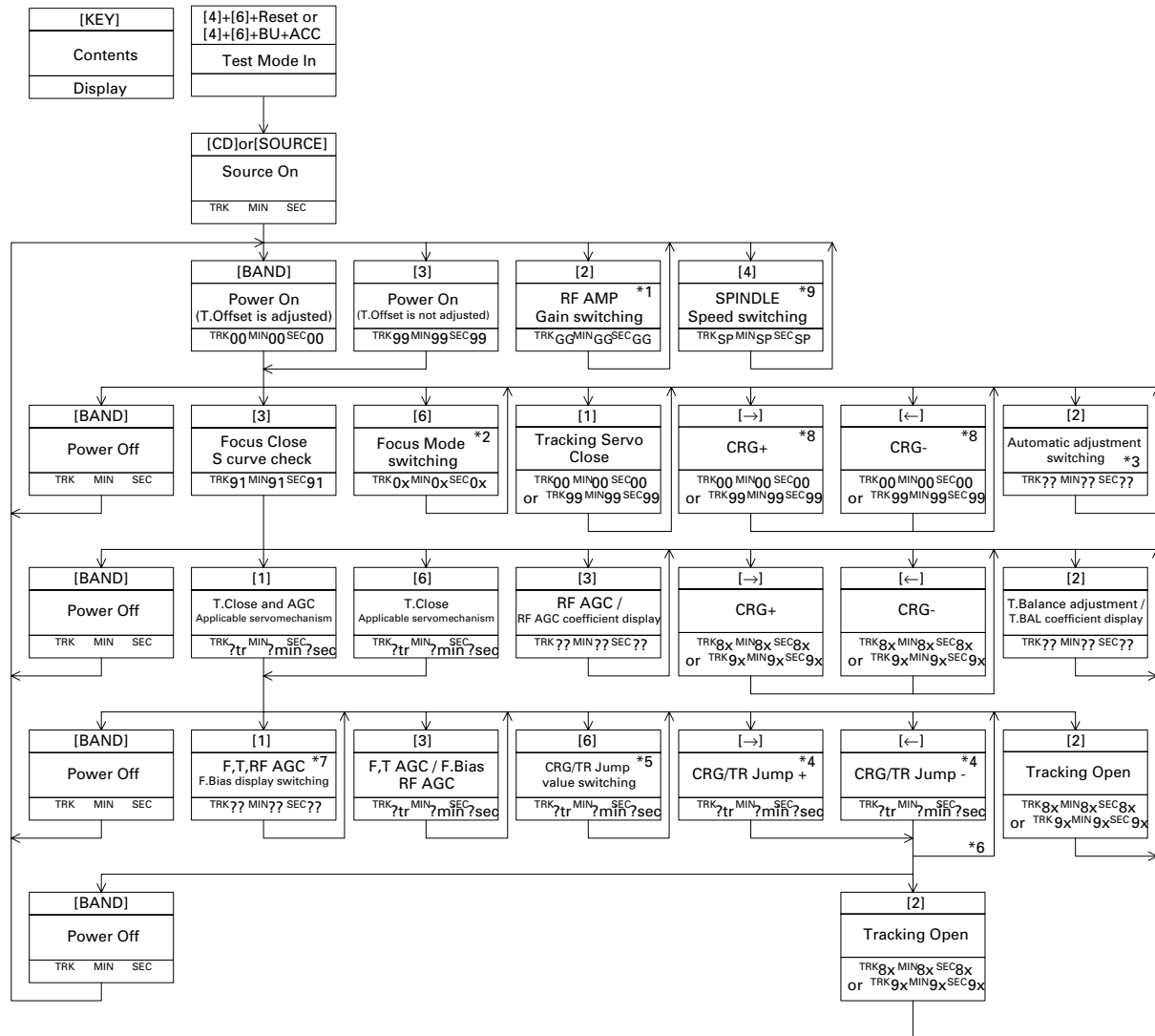
- b. If you have pressed the (→) key or (←) key during focus search, turn off the power immediately to protect the actuator from damage caused by the lens stuck.

- c. For the TR jump modes except 100TR, the track jump operation will continue even if the key is released.

- d. For the CRG move and 100TR jump modes, the tracking loop will be closed at the same time when the key is released.

- e. When the power is turned off and on, the jump mode is reset to the single TR (91), the RF amp gain is set to 0dB, and the auto-adjustment values are reset to the default settings.

Flow Chart



- *1) TYP → -6dB → -12dB
TRK MIN SEC → TRK 06 MIN 06 SEC 06 → TRK 12 MIN 12 SEC 12
- *2) Focus Close → S.Curve check setting → F.EQ measurement setting
TRK 00 MIN 00 SEC 00 → TRK 01 MIN 01 SEC 01 → TRK 02 MIN 02 SEC 02
(TRK 99 MIN 99 SEC 99)
- *3) F.Offset Display → T.Offset Display → Switch to the order of the original display
- *4) 1TR / 32TR / 100TR
- *5) Single TR → 32TR → 100TR → CRG Move
9x(8x) : 91(81) 92(82) 93(83) 94(84)
- *6) Only at the time of CRG move, 100TR jump
- *7) TRK/MIN/SEC → F.AGC → T.AGC → F Bias → RF AGC

*8) CRG motor voltage = 2[V]

*9) Applicability : A, B, C, D, E, F
TYP(1X) → 2X → 1X
TRK MIN SEC → TRK 22 MIN 22 SEC 22 → TRK 11 MIN 11 SEC 11

As for the double speed (2x), audio output cannot be supported

Applicability : G
TYP(2X) → 1X → 2X
TRK MIN SEC → TRK 11 MIN 11 SEC 11 → TRK 22 MIN 22 SEC 22

[Key]	Operation
	Test Mode
[BAND]	Power On / Off
[→]	CRG + / TR Jump + (Direction of the external surface)
[←]	CRG - / TR Jump - (Direction of the internal surface)
[1]	U.CLS and AGC and Applicable servomechanism / AGC, AGC display setting
[2]	RF Gain switching / Offset adjustment display / T.Balance adjustment / T.Open
[3]	Close, S.Curve / Rough Servo and RF AGC / F, T, RF AGC
[4]	SPDL 1X / 2X switching As for the double speed (2x), audio output cannot be supported.
[5]	Error Rate measurement 1st - ON : ERR count Beginning (30Sec) 2nd - ON : BER display data [%]
[6]	F.Mode switching / Tracking Close / CRG + TR Jump switching

6.3 CHECKING THE GRATING AFTER CHANGING THE PICKUP UNIT



• Note :

The grating angle of the PU unit cannot be adjusted after the PU unit is changed. The PU unit in the CD mechanism module is adjusted on the production line to match the CD mechanism module and is thus the best adjusted PU unit for the CD mechanism module. Changing the PU unit is thus best considered as a last resort. However, if the PU unit must be changed, the grating should be checked using the procedure below.

• Purpose :

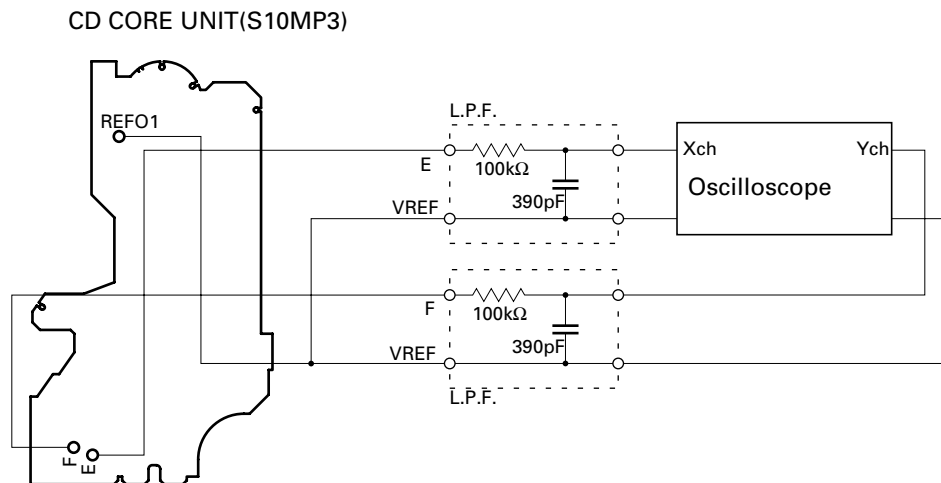
To check that the grating is within an acceptable range when the PU unit is changed.

• Symptoms of Mal-adjustment :

If the grating is off by a large amount symptoms such as being unable to close tracking, being unable to perform track search operations, or taking a long time for track searching.

• Method :

- | | |
|-----------------------|----------------------------|
| • Measuring Equipment | • Oscilloscope, Two L.P.F. |
| • Measuring Points | • E, F, REFO1 |
| • Disc | • ABEX TCD-782 |
| • Mode | • TEST MODE |



• Checking Procedure

1. In test mode, load the disc and switch the 3V regulator on.
2. Using the → and ← buttons, move the PU unit to the innermost track.
3. Press key 3 to close focus, the display should read "91". Press key 2 to implement the tracking balance adjustment the display should now read "81". Press key 3. The display will change, returning to "81" on the fourth press.
4. As shown in the diagram above, monitor the LPF outputs using the oscilloscope and check that the phase difference is within 75° . Refer to the photographs supplied to determine the phase angle.
5. If the phase difference is determined to be greater than 75° try changing the PU unit to see if there is any improvement. If, after trying this a number of times, the grating angle does not become less than 75° then the mechanism should be judged to be at fault.

• Note

Because of eccentricity in the disc and a slight misalignment of the clamping center the grating waveform may be seen to "wobble" (the phase difference changes as the disc rotates). The angle specified above indicates the average angle.

• Hint

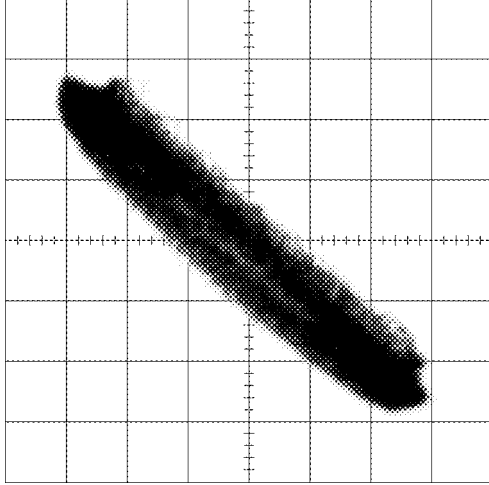
Reloading the disc changes the clamp position and may decrease the "wobble".

Grating waveform

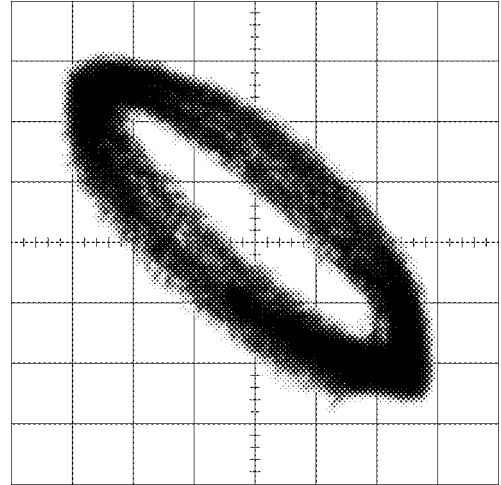
Ech → Xch 20mV/div, AC

Fch → Ych 20mV/div, AC

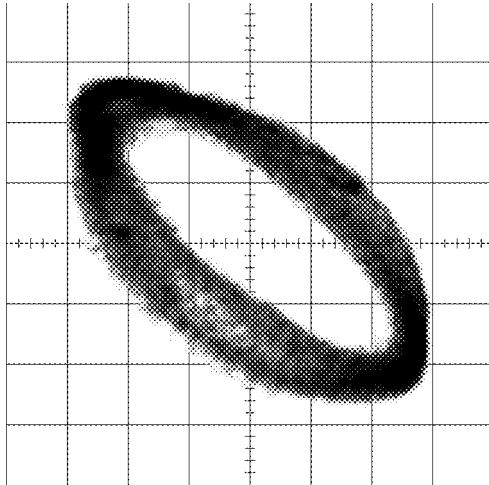
0°



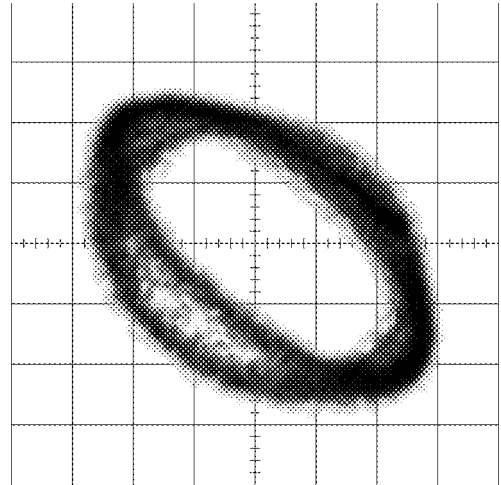
30°



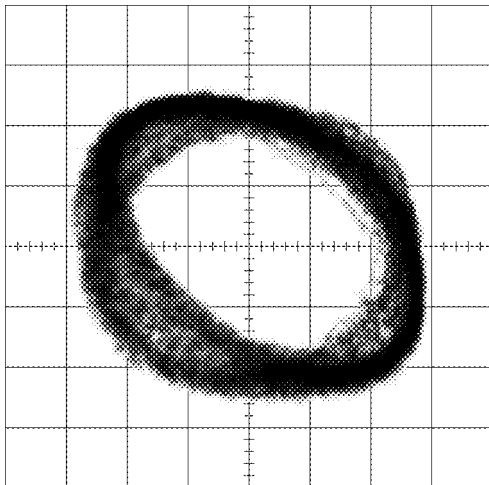
45°



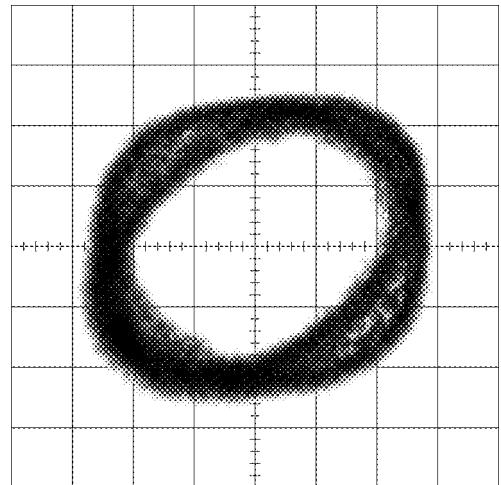
60°



75°



90°



A

B

C

D

E

F

6.4 ERROR MODE

● Error Messages

Error is displayed with number for Error cause when CD is inoperative or stops with Error during operation. The purpose is to reduce nonsense calls from users as well as to assist all related analysis and repair for defects at service station.

(1) Basic Display Method

1) When CSMOD (CD mode area for system) is SERRORM, Error code will be written in DMIN (minutes area for display), DSEC (seconds area for display). The same data shall be written in DMIN and DSEC. DTNO is blank as usual.

2) Display Example of Head Unit

The following is about LCD display ability. xx is Error number.

8 digits	6 digits	4 digits
ERROR-xx	ERR-xx	E-xx
	OR	
	Err-xx	

*) In case of OEM, Error display will follow the specification defined by OEM makers.

(2) Error Code List

No.	Classification	Contents	Details • Cause
10	Electricity	Carriage Home NG	CRG can't move to the inner. CRG can't move from the inner. → HOME SW failure, CRG movement failure.
11	Electricity	Focus Search NG	Focus can't be caught. → Back of Disc / Severe dirt and vibration.
12	Electricity	Spindle Lock NG Subcode NG RF-amp NG	Not spindle, lock. Wrong subcode (can't read). → Defective Spindle. Scratch and dirt on Disc. Intense vibration. The appropriate gain of the RF amp cannot be obtained. → Defective spindle. → Scratched or dirty disc. Severe vibration. Abnormal CD signals. → Blanc CD-R disc. Disc inserted upside down.
17	Electricity	Setup NG	AGC protection doesn't work, out of Focus soon. → Scratch on Disc/Severe dirt and vibration.
22	Disc	Impossible to play	There is no playable MP3 or WMA file present in a disc. → No MP3 or WMA file exists in a CD-ROM disc inserted.
23	Disc	File Format NG	Contents are stored in an incompatible file format. → The contents in a CD-ROM disc inserted are recorded in a file format other than ISO9660 Level-1 and 2.
30	Electricity	Search Time Out	Can't reach the target address. → Defective CRG/tracking, or scratch on Disc.
44	Disc	Impossible to play	There is no playable TRK No. present in a disc. → All TRK Nos. In a disc inserted are specified as a track which should be skipped, in the track skip information.
50	Mecha	Disc Load / Eject NG	Disc loading/ejection cannot be complete. → Foreign objects entered into the mechanism. Disc caught in between during loading/ejection.
A0	System	Power NG	Power supply (VD) isn't connected to the ground. → Defective SW transistor. Abnormal power (failed connector)

Note : Error doesn't display in mechanism only. (CD off causes mechanism off)

If TOC can't be read, error wouldn't occur, but mechanism still continues its operation.

When newly design head unit, be sure to apply as the display examples above.

The upper digits of error code is mainly classified by 3 kinds as follows:

1x: Setup related error, 3x: Search related error, Ax: Other errors.

7. GENERAL INFORMATION

7.1 DIAGNOSIS

7.1.1 DISASSEMBLY

● Removing the Case (not shown)

1. Remove the Case.

● Removing the CD Mechanism Module (Fig.1)

- 1 Remove the four screws.

Disconnect the connector and then remove the CD Mechanism Module.

● Removing the Grille Assy (Fig.1)

- 2 Remove the two screws and then remove the Grille Assy.

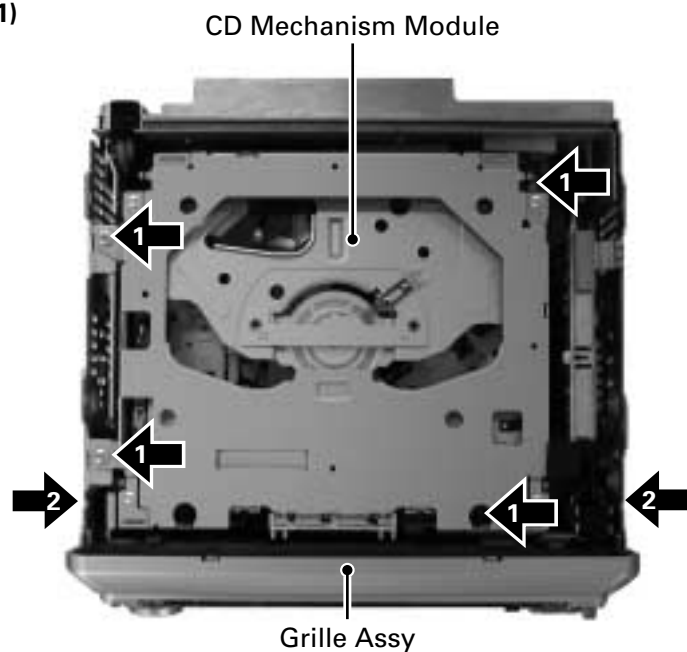


Fig.1

● Removing the Tuner Amp Unit (Fig.2)

- 1 Remove the screw.
- 2 Remove the three screws.
- 3 Straight the tabs at three locations indicated.
- 4 Remove the screw and then remove the Tuner Amp Unit.

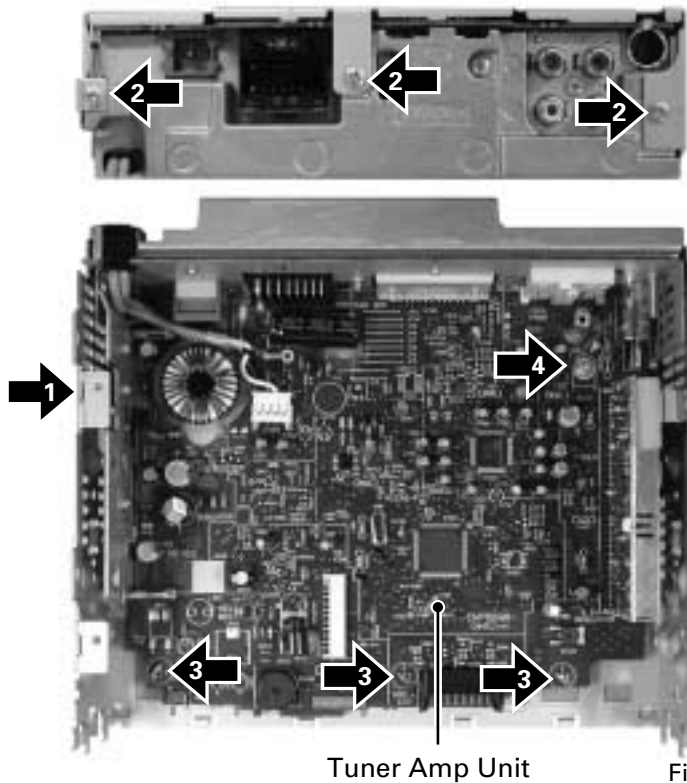
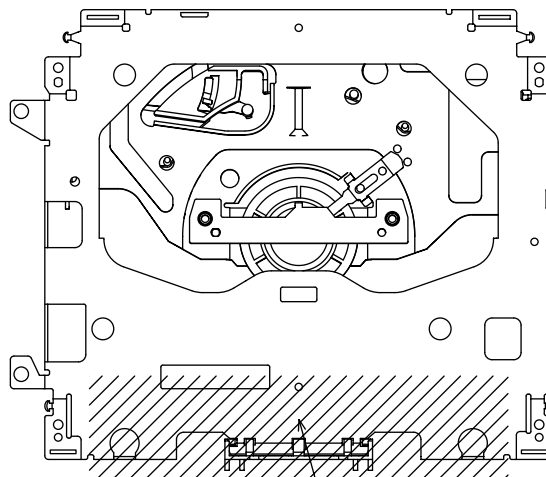


Fig.2

● How to hold the Mechanism Unit

1. Hold the top and bottom frame.
2. Do not squeeze top frame's front portion too tight, because it is fragile.

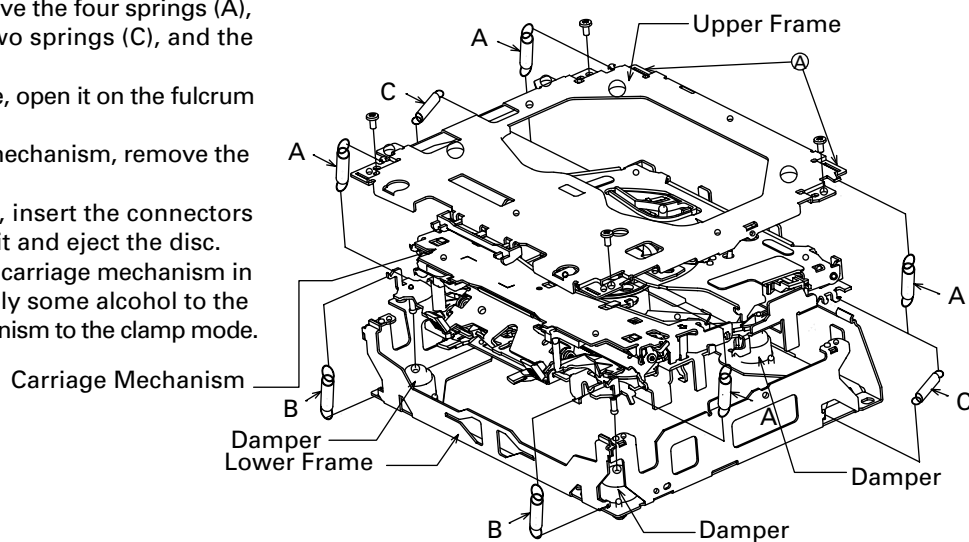


Do not squeeze.

● Removing the Upper and Lower Frames

1. With a disc clamped, remove the four springs (A), the two springs (B), the two springs (C), and the four screws.
2. To remove the upper frame, open it on the fulcrum A.
3. While lifting the carriage mechanism, remove the three dampers.
4. With the frames removed, insert the connectors coming from the main unit and eject the disc.

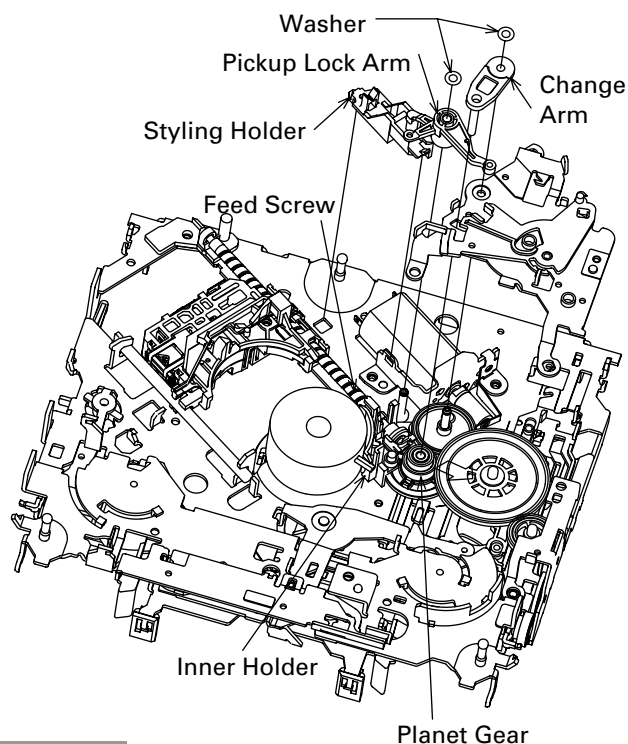
Caution: Before installing the carriage mechanism in the frames, be sure to apply some alcohol to the dampers and set the mechanism to the clamp mode.



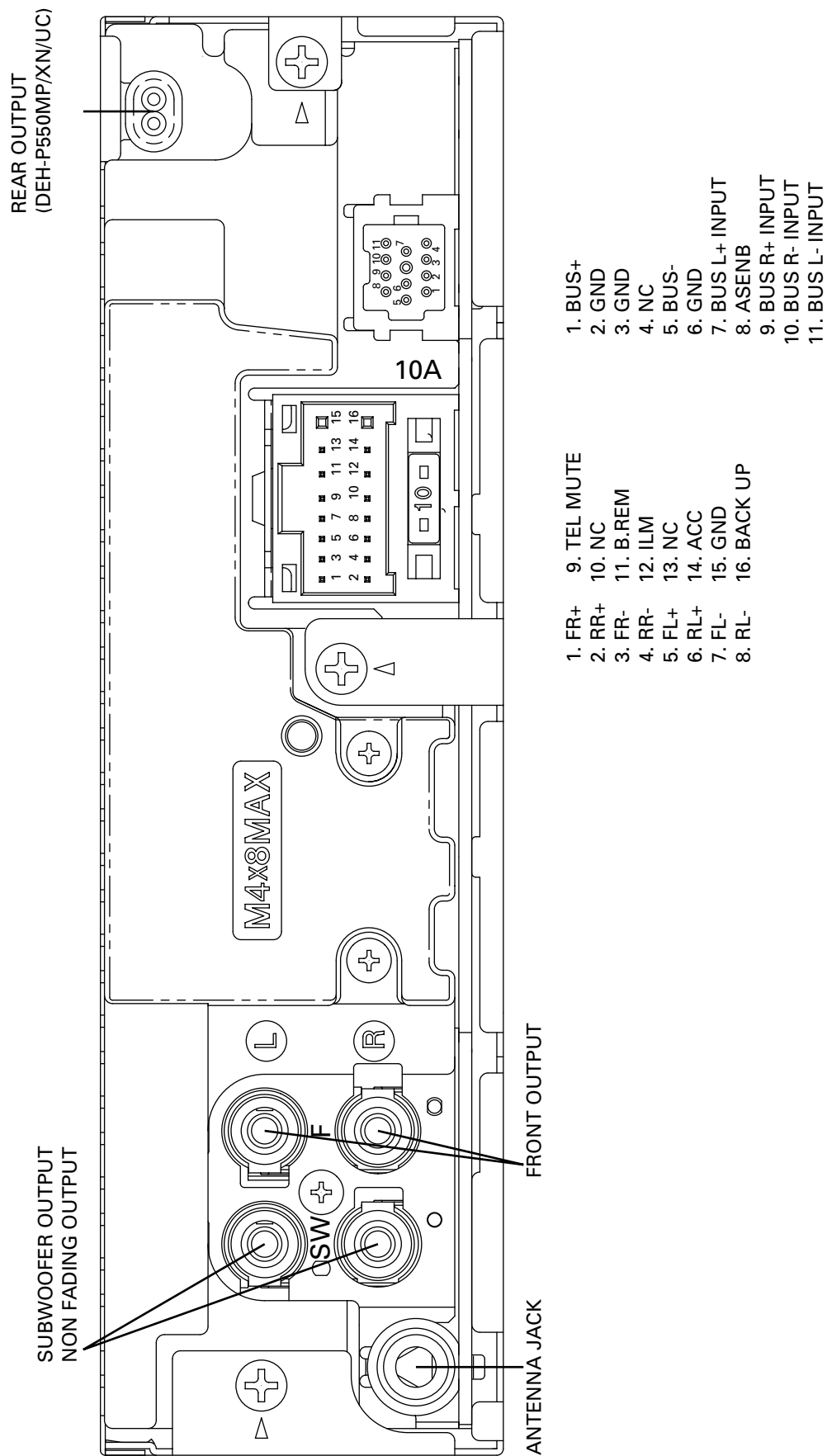
● Removing the Pickup Unit

1. Set the mechanism to the clamp mode.
2. Remove the lead wires from the inner holder.
3. Remove the two washers, styling holder, change arm, and pickup lock arm.
4. While releasing from the hook of the inner holder, lift the end of the feed screw.

Caution: In assembling, move the planet gear to the load/eject position before setting the feed screw in the inner holder.



7.1.2 CONNECTOR FUNCTION DESCRIPTION



7.2 PARTS

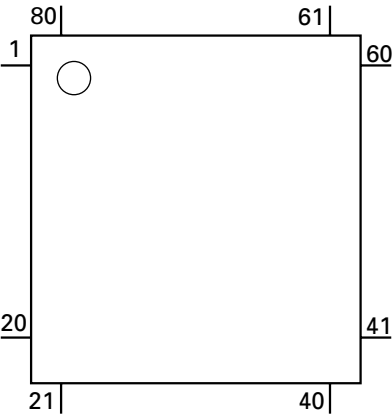
7.2.1 IC

PD6294A	UPD63760GJ
NJM2391DL1-33	UPD61002GC
PD5800A	PE5352B
MSM51V4265EP-70TS	
BA25BC0WFP	

● Pin Functions (PD6294A)

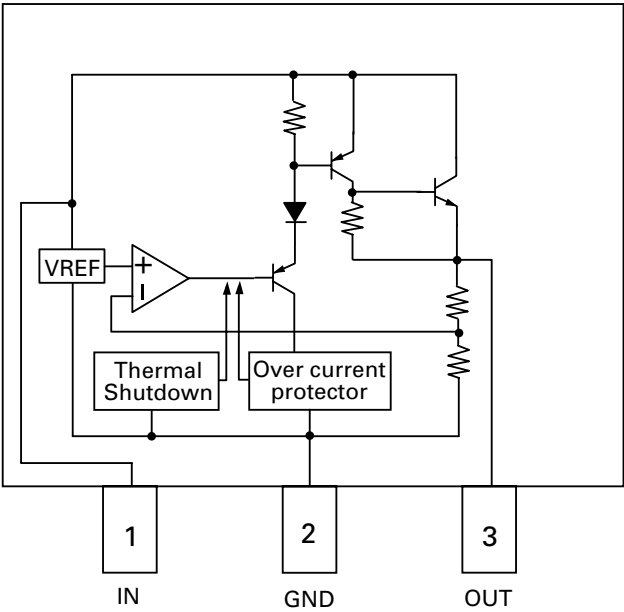
Pin No.	Pin Name	I/O	Function and Operation
1	VSS		GND
2	X1		Crystal oscillator connection pin
3	X0		Crystal oscillator connection pin
4	NC		Not used
5,6	MOD1,0	I	Connect to GND
7	DIMMER	O	Dimmer select output
8	KYDT	O	Key data output
9	DPDT	I	Display data input
10	REMIN	I	Remote control pulse input
11	GRN		Dual Illumination (Green)
12	AMB		Dual Illumination (Amber)
13-16	KD4-1	I	Key data input
17-22	KST6-1	O	Key strobe output
23	VDD		VDD
24-73	SEG49-0	O	LCD segment output
74-77	COM3-0	O	LCD common output
78	VLCD	I	LCD voltage input
79,80	V2,1		Power supply terminal

*PD6294A



IC's marked by * are MOS type.
Be careful in handling them because they are very liable to be damaged by electrostatic induction.

NJM2391DL1-33



● Pin Functions(PD5800A)

Pin No.	Pin Name	I/O	Function and Operation
1	SYSPW	O	System power control output
2	DORAON	O	Tuner unit power supply output
3-5	NC		Not used
6	BYTE	I	External data bus width change input
7	CNVSS	I	Processor mode change input
8	TELIN	I	TEL : Cellular mute input
9	NC		Not used
10	RESET	I	Reset input
11	XOUT	O	Clock output
12	VSS	I	GND
13	XIN	I	Clock input
14	VCC	I	Power supply input
15-18	NC		Not used
19	RX2	I	IPBUS : Input 2
20	LCDPW	O	Back light power supply output
21	NC		Not used
22	PEE	O	PEE sound output
23	NC		Not used
24	BRST	O	PBUS : Reset output
25	BRXEN	I/O	PBUS : Communication input/output
26	BSRQ	I	PBUS : Communication demand input
27	RX	I	IPBUS : Input
28	TX	O	IPBUS : Output
29	BSO	O	PBUS : Output
30	BSI	O	PBUS : Input
31	BSCK	O	PBUS : Clock
32	NC		Not used
33	DPDT	O	GRILL : Data output
34	KYDT	I	GRILL : Data input
35, 36	ROT1, 0	I	Rotary encoder pulse input1, 0
37	PCL	O	Output for clock adjustment
38	SWVDD	O	GRILL : Chip enable output
39	$\overline{\text{DSENS}}$	I	Detach sense input
40	FLPILM	O	Illumination output inside flap
41	ILMPW	O	Illumination output
42	EJTIN	I	Eject key input
43-55	NC		Not used
56	CSENSOUT	O	CSENS state output(H : FLAP open)
57	EMUTE	O	EVOL : Mute output
58, 59	NC		Not used
60	VCC	I	Power supply input
61	NC		Not used
62	VSS	I	GND
63-66	NC		Not used
67	DALMON	O	For consumption current reduction
68	NC		Not used
69	$\overline{\text{TUNPCE2}}$	O	TUNER : Chip enable output(EEPROM)
70	$\overline{\text{TUNPCE}}$	O	TUNER : Chip enable output(PLL)
71	$\overline{\text{ROMCS}}$	O	ROM correction : Chip select
72	$\overline{\text{ASENS}}$	I	ACC sense
73	$\overline{\text{BSENS}}$	I	Back up sense
74	ROMCK	O	ROM correction : Clock output
75	ROMDATA	I/O	ROM correction : Data input/output
76	VST	O	EVOL : Strobe output
77	VDT	O	EVOL : Data output
78	VCK	O	EVOL : Clock output
79	IPPW	O	IPBUS : Driver power supply control output
80	ASENBO	O	IPBUS : Slave ACC sense output
81	$\overline{\text{ISENS}}$	I	Illumination sense input
82-84	NC		Not used

A

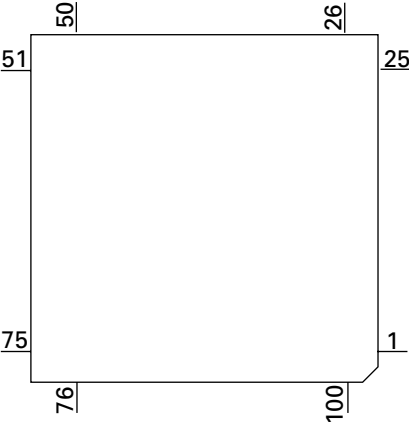
Pin No.	Pin Name	I/O	Format Function and Operation
85	MUTE	O	MUTE output
86	TESTIN	I	Test program input
87-89	NC		Not used
90	LVLINR	I	Level indicator R.ch input
91	CSENS	I	Flap opening-and-closing sense input
92	LVLINL	I	Level indicator L.ch input
93	MODEL0		Model 0
94	AVSS	I	GND
95	SL	I	TUNER : Signal level input
96	VREF		AD translation reference voltage
97	AVCC	I	AD translation power supply input terminal
98	TUNPDI	I	TUNER : PLL communication
99	TUNPDO	O	TUNER : Data output(PLL)
100	TUNPCK	O	TUNER : Clock output(PLL)

B

C

* PD5800A

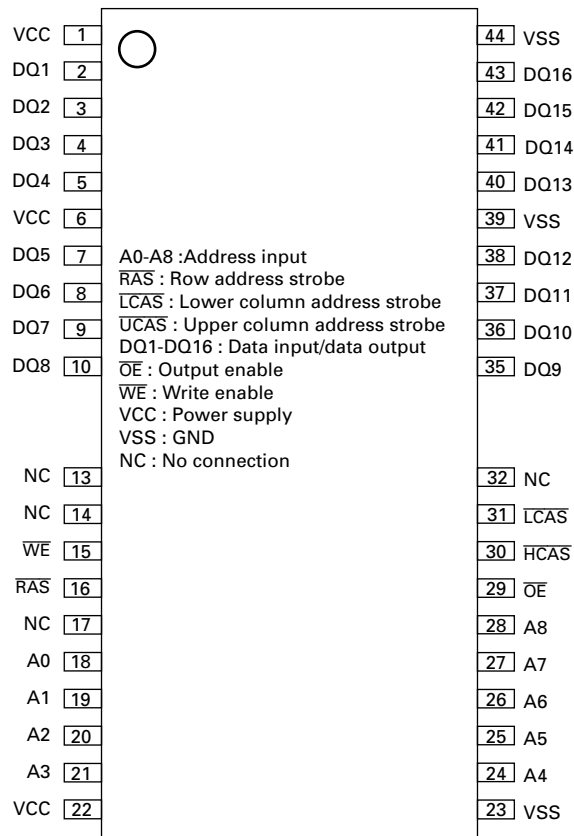
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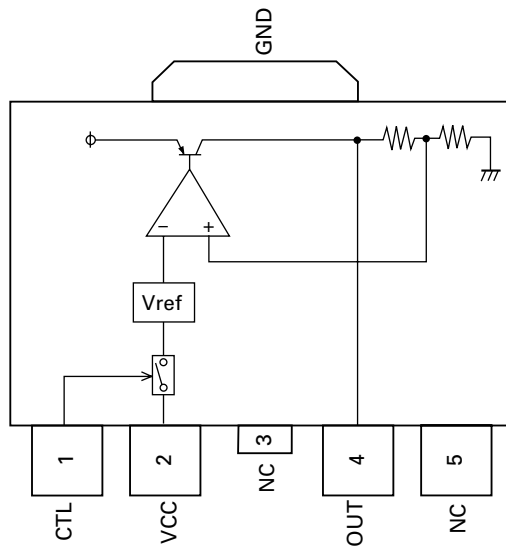
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F

* MSM51V4265EP-70TS



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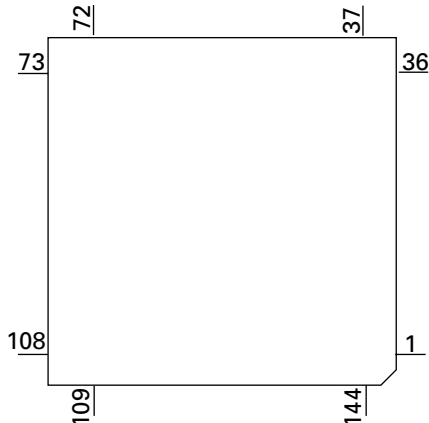


● Pin Functions (UPD63760GJ)

Pin No.	Pin Name	I/O	Function and Operation
1	R.GND		GND for DRAM I/F
2	RST	I	Input of reset
3-7	AB12-8	I	Address bus 12-8 from the microcomputer
8-15	AD7-0	I/O	Address/data bus 7-0 to the microcomputer
16	CS	I	Chip selection
17	ASTB	I	Address strobe
18	READ	I	Control signals (read)
19	WRITE	I	Control signals (write)
20	WAIT	O	Control signals (wait)
21	INTQ		Interruption signals to the external microcomputer
22	IFMODE	I	Switching between the data buses (16bit/8bit)
23	D.VDD		Power supply for digital circuits
24	XTALEN1	I	Permission to oscillate 16.9344MHz
25	XTALEN2	I	Permission to oscillate 24.576MHz
26	DA.VDD		Power supply for DAC
27	ROUT	O	Output of audio for the right channel
28	DA.GND		GND for DAC
29	R+	O	Output of the right channel audio PWM
30	R-	O	Output of the right channel audio PWM
31	REGC		Connected to the capacitor for band gap
32	L-	O	Output of the left channel audio PWM
33	L+	O	Output of the left channel audio PWM
34	DA.GND		GND for DAC
35	LOUT	O	Output of audio for the left channel
36	DA.VDD		Power supply for DAC
37	X.VDD		Power supply for the crystal oscillator
38	XTAL1		Connected to the crystal oscillator (16.9344MHz)
39	XTAL1		Connected to the crystal oscillator (16.9344MHz)
40, 41	X.GND		Ground for the crystal oscillator
42	XTAL2		Connected to the crystal oscillator (24.576MHz)
43	XTAL2		Connected to the crystal oscillator (24.576MHz)
44	X.VDD		Power supply for the crystal oscillator
45	D.GND		GND for digital circuits
46	DIN	I	Input of audio data
47	DOUT	O	Output of audio data
48	SCKIN	I	Clock input for audio data
49	SCKO	O	Clock output for audio data
50	LRCKIN	I	Input of LRCK for audio data
51	LRCK	O	Output LRCK for audio data
52	TESTX	O	Output for tests
53	RFOK	O	Output of RFOK
54	C16M	O	Output of 16.9344MHz
55	TESTEN	I	Connected to GND
56	TEST4	I	Connected to GND
57	D.VDD		Power supply for digital circuits
58	RFCK/HOLD	O	Output of RFCK/HOLD signal
59	WFCK/MIRR	O	Output of WFCK/MIRR signal
60	PLCK	O	Output of PLCK
61	LOCK	O	Output of LOCK
62	C1D1	O	Information on error correction
63	C1D2	O	Information on error correction
64	C2D1(RMUTE)	O	Information on error correction (mute for Rch)
65	C2D2(LMUTE)	O	Information on error correction (mute for Lch)
66	C2D3	O	Information on error correction
67	D.GND		Ground for digital circuits
68	RAS	O	Output of DRAM RAS
69	CAS0	O	Output of DRAM Lower CAS
70	CAS1	O	Output of DRAM Upper CAS
71	WE	O	Output of DRAM WE
72	OE	O	Output of DRAM OE

Pin No.	Pin Name	I/O	Function and Operation
73-88	RDB0-15	I/O	Input/output of DRAM Data0-15
89	D.GND		Ground for digital circuits
90-99	RA0-9	O	Output of DRAM Address0-9
100	D.VDD		Power supply for digital circuits
101-104	TEST0-3	I	Connected to GND
105	FD	O	Output of focus drive PWM
106	TD	O	Output of tracking drive PWM
107	SD	O	Output of thread drive PWM
108	MD	O	Output of spindle drive PWM
109	A.VDD		Power supply for the analog system
110	ATEST	O	Analog tests
111	EFM	O	Output of EFM signals
112	ASY	I	Input of asymmetry
113	C3T		Connection to the capacitor for detecting 3T
114	A.GND		Ground for the analog system
115	RFI	I	Input of RF
116	AGCO	O	Output of RF
117	AGCI	I	Input of AGC
118	RFO	O	Output of RF(AGC)
119, 120	EQ2, 1		Equalizer 2, 1
121	RF2-	I	Reversal input of RF2
122	RF-	I	Reversal input of RF
123	A.GND		Ground for the analog system
124	A	I	Input of A
125	C	I	Input of C
126	B	I	Input of B
127	D	I	Input of D
128	F	I	Input of F
129	E	I	Input of E
130	A.VDD		Power supply for the analog system
131	REFOUT	O	Output of reference voltage
132	REFC		Connected to the capacitor for output of REFOUT
133	FE-	I	Reversal input of FE
134	FEO	O	Output of FE
135	TE-	I	Reversal input of TE
136	TEO	O	Output of TE
137	TE2	O	TE2
138	TEC	I	TEC
139	A.GND		Ground for the analog system
140	LDREGO	O	Output of REG voltage for APC
141	PD	I	Input of PD
142	LD	O	Output of LD
143	PN	I	Assignment of pickup polarity
144	A.VDD		Power supply for the analog system

* UPD63760GJ

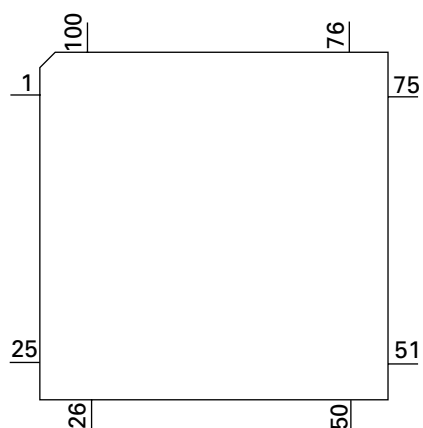


● Pin Function (UPD61002GC)

Pin No.	Pin Name	I/O	Function and Operation
1	VDD3	I/O	Power supply (3.3V)
2-4	NC		Not used
5	GND3		GND
6,7	NC		Not used
8	DO0	O	PCM output data
9	VDD2		Power supply (2.5V)
10	CKI	I	Clock input
11	DVDD		Power supply (PLL) (Digital)
12	AVDD		Power supply (PLL) (Analog)
13	AGND		GND (PLL) (Analog)
14	DGND		GND (PLL) (Digital)
15	VDD3I		Interface terminal protection
16	LRCKO	O	PCM output LRCK
17	BCKO	O	PCM output bit clock
18	NC		Not used
19	VDD3		Power supply (3.3V)
20	GND2		GND
21	MCK44	I	Audio master clock input
22	MCK48	I	Audio master clock input
23,24	P10, 11	I/O	Port
25	VDD2		Power supply (2.5V)
26	GND3		GND
27-32	P12-17	I/O	Port
33	VDD2		Power supply (2.5V)
34	P00/INTP00	I/O	Port
35,36	NC		Not used
37	P03/INTP03	I/O	Port
38	P04/INTP04	I/O	Port
39	P05/INTP05	I/O	Port
40	GND2		GND
41,42	P06, 07	I/O	Port
43	VDD3		Power supply (3.3V)
44-49	HAD0-5	I/O	Host address / Data bus
50	GND3		GND
51	VDD3		Power supply (3.3V)
52-55	HAD6-9	I/O	Host address / Data bus
56	GND3		GND
57-59	HAD10-12	I/O	Host address / Data bus
60	VDD2		Power supply (2.5V)
61-63	HAD13-15	I/O	Host address / Data bus
64	VDD3		Power supply (3.3V)
65	HAST	I	Host address strobe
66	HCSB	I	Host chip select
67	HR/WB	I	Host read / Write status
68	HDSTB	I	Host data strobe
69	GND2		GND
70	NC		Not used
71	EXTDIR	I	Bus direction flag from external
72,73	DBBWRDY0, 1	O	DBB write ready flag
74	DBBRRDY0	O	DBB read ready flag
75	VDD2		Power supply (2.5V)
76	GND3		GND
77	DBBRRDY1	O	DBB read ready flag
78	GND3		GND
79	RESETB	I	Reset
80	GND3		GND
81	VDD3		Power supply (3.3V)
82	GND3		GND
83	PLLCONT	I	PLL control
84	GND3		GND

Pin No.	Pin Name	I/O	Function and Operation
85	NC		Not used
86	GND2		GND
87	DI3	I	PCM input data
88	LRCKI3	I	PCM input LRCK
89	BCKI3	I	PCM input bit clock
90	DI2	I	PCM input data
91	LRCKI2	I	PCM input LRCK
92	BCKI2	I	PCM input bit clock
93	DI1	I	PCM input data
94	LRCKI1	I	PCM input LRCK
95	BCKI1	I	PCM input bit clock
96	VDD2		Power supply (2.5V)
97	DI0	I	PCM input data
98	LRCKI0	I	PCM input LRCK
99	BCKI0	I	PCM input bit clock
100	GND2		GND

*UPD61002GC



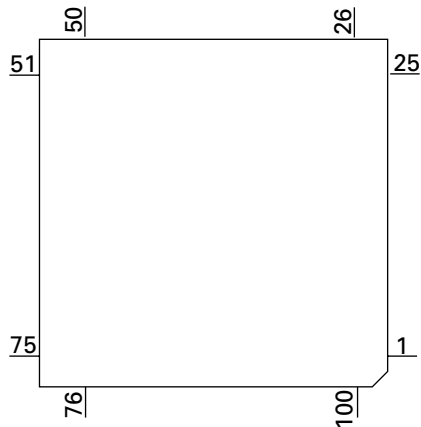
Pin Functions (PE5352B)

Pin No.	Pin Name	I/O	Format	Function and Operation
1	BSO	O	C	P-Bus serial data output
2	BSCK	I/O	/C	P-Bus serial clock input/output
3, 4	DFS1, 2	O	C	DA I/F IC sampling frequency setting output 1, 2
5	DCKS	O	C	DA I/F IC clock subharmonic number selection output
6	EVDD			E power supply Positive power supply
7	EVSS			E power supply GND
8	DSPOK	I		DSP microcomputer initialization OK input
9	DCOPY	O	C	DA I/F IC copy flag setting output
10	CRST	O	C	Compression IC reset control output
11, 12	NC			Not used
13	EMPH	O	C	Emphasis information output
14	EMPH	O	C	Emphasis information output
15	DSPMUTE	O	C	DOUT mute output
16	DSET	O	C	Disc set indicator lighting output
17	ADENA	O	C	A/D reference voltage supply control output
18	IC/VPP			IC : VSS direct connection/VPP : Pull-down
19	BRXEN	I/O	/C	P-Bus reception is possible
20	BSRQ	I/O	/C	P-Bus service request demand
21	XTALEN1	O	C	CD LSI 16.9344MHz oscillation permission output
22	XTALEN2	O	C	CD LSI 24.576MHz oscillation permission output
23	XRST	O	C	CD LSI reset control output
24	VDCONT	O	C	VD power supply control output
25	CD3VON	O	C	CD +3.3V power supply control output
26	CONT	O	C	Servo driver power supply control output
27	XWAIT	I		CD LSI wait control signal input
28	LOEJ	O	C	The direction change output of LOAD/EJECT
29	CLCONT	O	C	Driver input change output
30	CDMUTE	O	C	CD mute control output
31	RESET	I		System reset input
32	XT1	I		Connected to the oscillator for subclock (connected to VSS via the resistor)
33	XT2			Connected to the oscillator for subclock (Open)
34	REGC			Connected to the capacity stabilizing output of the regulator (an electrolytic capacitor of about 1μF)
35	X2			Oscillator connection for mainclock
36	X1	I		Oscillator connection for mainclock
37	VSS			GND
38	VDD			Positive power supply (5V)
39	CLKOUT	O	C	Internal system clock output (Open)
40	XWRITE	O		CD LSI write control signal output
41	UBEN	O		Not used (Open)
42	WR/W	O		WMA decoder Read/Write control signal output
43	XREAD	O		CD LSI read control signal output
44	XASTB	O		CD LSI address strobe output
45	LOCK	I		Spindle lock input
46	WRST	O	C	WMA decoder reset control output
47-54	AD0-7	I/O	/C	Address/Data bus 0-7
55	BVDD			B power supply Positive power supply (3.3V)
56	BVSS			B power supply GND
57-64	AD8-15	I/O	/C	Address/Data bus 8-15
65	XCS	O	C	CD LSI chip selection output
66	WCS	O	C	WMA decoder chip selection output
67, 68	DBBWRDY0, 1	I		Input of write-ready flag with WMA decoder DBBI0, 1
69, 70	DBBRRDY0, 1	I		Input of read-ready flag with WMA decoder DBBO0, 1
71	AVDD			A power supply Positive power supply (5V)
72	AVSS			A power supply GND
73	AVREF			The reference voltage input for A/D converter
74	VDSSENS			VD power supply short sense input
75	DSCSNS			Disc state sense input
76	TEMP			Temperature information sense input

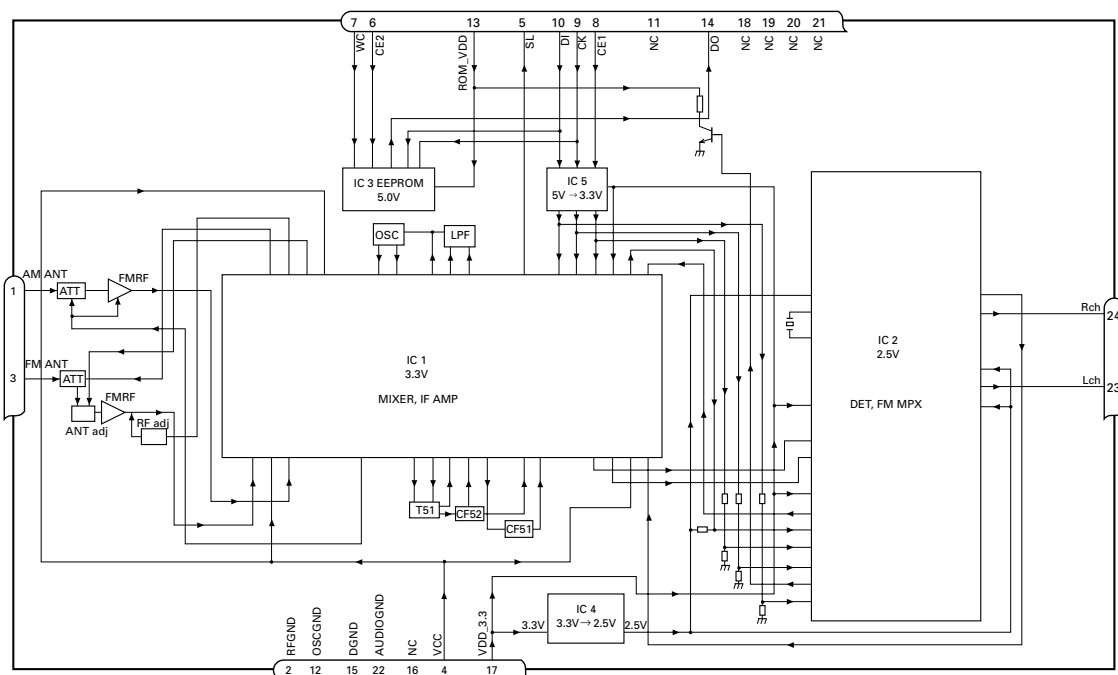
Pin No.	Pin Name	I/O	Format	Function and Operation
77	HOME	I		Home SW sense input
78	$\overline{\text{CSENS}}$	I		Flap closing sense input
79	RFOKIN	I		RFOK input chatter count input
80-82	NC			Connected to AVDD or AVSS via the resistor
83	WMAARI	I		Input of sensing existence of WMA decoder and DA I/F IC
84	TYPE_A/D	I		CD-DA Analog/Digital output change setup
85	$\overline{\text{TESTIN}}$	I		Chip check test program starting input
86	NC			Connected to EVDD or EVSS via the resistor
87	$\overline{\text{XINT}}$			CD LSI interruption signal input
88	$\overline{\text{WINT}}$			WMA decoder interruption signal input
89	BRST	I		P-Bus reset input
90	EJSW	I		Eject key input
91, 92	NC			Open
93	CLAMP	I	C	CLAMP SW sense input
94	ROMDATA	I/O	/C	E2PROM data input/output
95	ROMCS	O	C	E2PROM chip selection output
96	ROMCK	O	C	E2PROM clock output
97	FRXD	I		For flash rewriting (received signal)
98	FTXD	O	C	For flash rewriting (transmitted signal)
99	AO/DO	O	C	The output for Analog/Digital voice output distinction
100	BSI	I		P-Bus serial data input

* PE5352B

Format	Meaning
C	CMOS



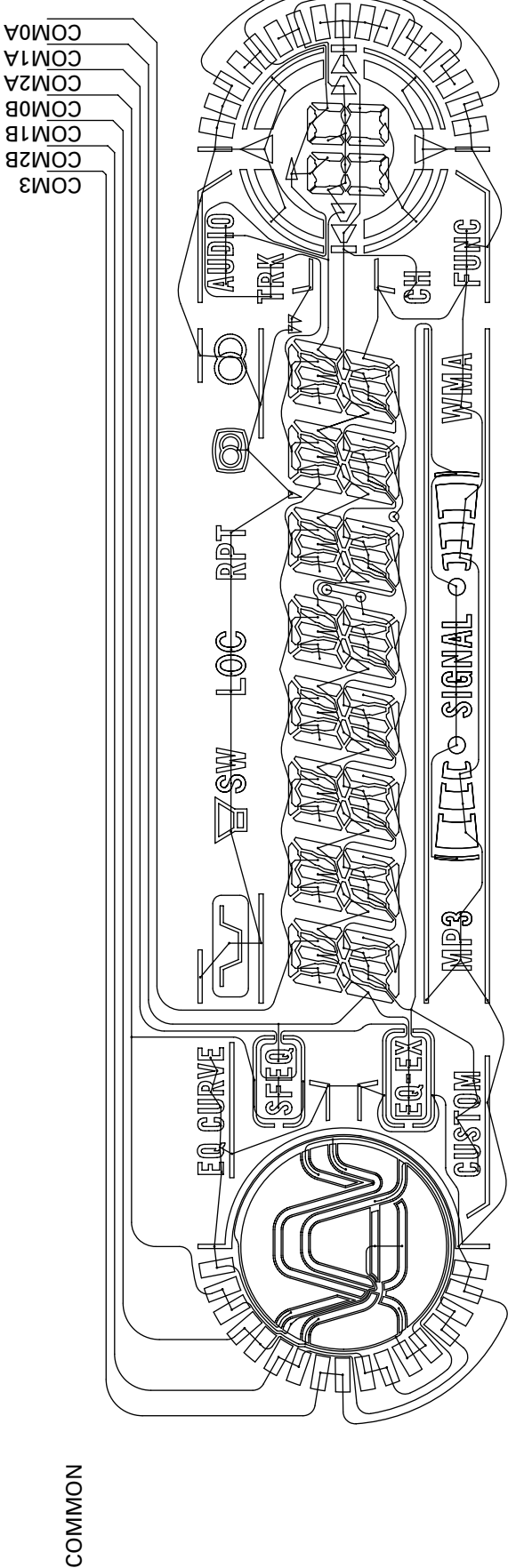
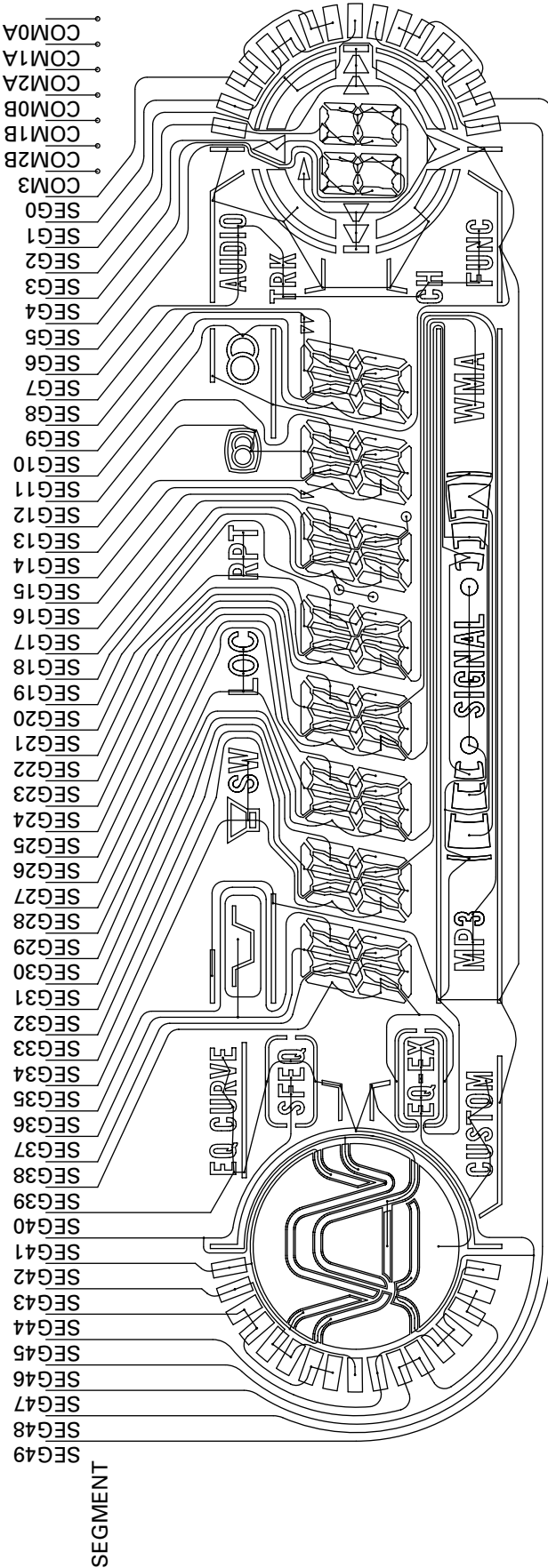
● FM/AM Tuner Unit



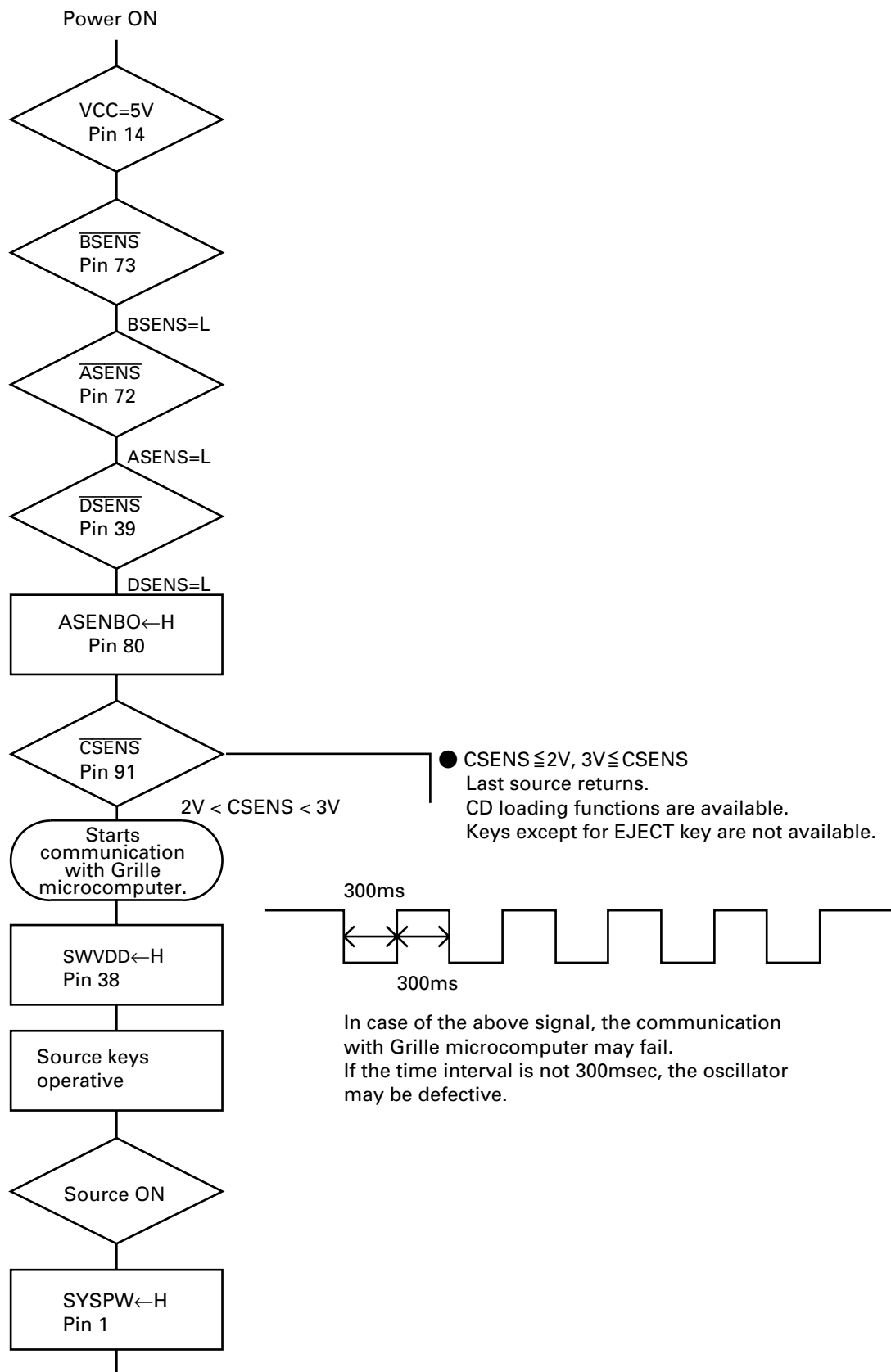
No.	Symbol	I/O	Explain	
1	AMANT	I	AM antenna input	AM antenna input high impedance AMANT pin is connected with an all antenna by way of 4.7μH. (LAU type inductor) A series circuit including an inductor and a resistor is connected with RF ground for the countermeasure against the ham of power transmission line.
2	RFGND		RF ground	Ground of antenna block
3	FMANT	I	FM antenna input	Input of FM antenna 75Ω Surge absorber(DSP-201M-S00B) is necessary.
4	VCC		power supply	The power supply for analog block. D.C 8.4V ± 0.3V
5	SL	O	signal level	Output of FM/AM signals level
6	CE2	I	chip enable-2	Chip enable for EEPROM "Low" active
7	WC	I	write control	You can write EEPROM, when EEPROM write control is "Low". Ordinary non connection
8	CE1	I	chip enable-1	Chip enable for AF•RF "High" active
9	CK	I	clock	Clock
10	DI	I	data in	Data input
11	NC		non connection	Not used
12	OSCGND		osc ground	Ground of oscillator block
13	ROM_VDD		power supply	Power supply for EEPROM pin 13 is connected with a power supply of micro computer.
14	DO	O	data out	Data output
15	DGND		digital ground	Ground of digital block
16	NC		non connection	Not used
17	VDD_3.3		power supply	The power supply for digital block. 3.3V ± 0.2V
18	NC		non connection	Not used
19	NC		non connection	Not used
20	NC		non connection	Not used
21	NC		non connection	Not used
22	AUDIOGND		audio ground	Ground of audio block
23	L ch	O	L channel output	FM stereo "L-ch" signal output or AM audio output
24	R ch	O	R channel output	FM stereo "R-ch" signal output or AM audio output

7.2.2 DISPLAY

● LCD(CAW1755)



7.3 OPERATIONAL FLOW CHART



Completes power-on operation.
(After that, proceed to each source operation)

7.4 CLEANING



Before shipping out the product, be sure to clean the following portions by using the prescribed cleaning tools:

Portions to be cleaned	Cleaning tools
CD pickup lenses	Cleaning liquid : GEM1004 Cleaning paper : GED-008

Head unit

① CLOCK button

Press to change to the clock display.

② VOLUME

When you press **VOLUME**, it extends outward so that it becomes easier to turn. To retract **VOLUME**, press it again. Rotate to increase or decrease the volume.

③ AUDIO button

Press to select various sound quality controls.

④ ▲/▼/◀/▶ buttons

Press to do manual seek tuning, fast forward, reverse and track search controls. Also used for controlling functions.

⑤ OPEN button

Press to open the front panel.

⑥ BAND button

Press to select among three FM and one AM bands and cancel the control mode of functions.

⑦ EQ-EX button

Press and hold to switch between EQ-EX and SFEQ functions. Press to operate each function.

⑧ FUNCTION button

Press to select functions.

⑨ 1-6 buttons

Press for preset tuning and disc number search when using a multi-CD player.


⑩ DISPLAY button

Press to select different displays.

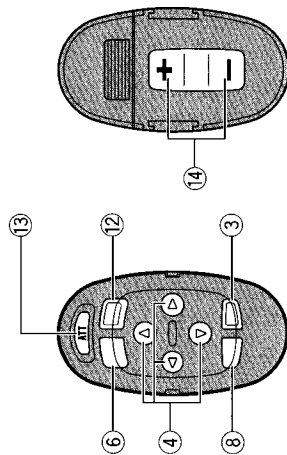
⑪ EQ button

Press to select various equalizer curves.

⑫ SOURCE button

This unit is turned on by selecting a source. Press to cycle through all of the available sources. 

Remote control



Operation is the same as when using the button on the head unit. See the explanation of the head unit about the operation of each button with the exception of **ATT**, which is explained below.

⑬ ATT button


Press to quickly lower the volume level, by about 90%. Press once more to return to the original volume level.

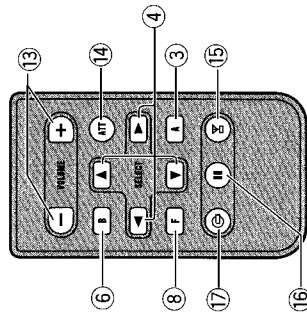
⑭ VOLUME button

Press to increase or decrease the volume.



Note

If you press **FUNCTION** on the remote control while pressing **BAND** on it, the remote control will not function properly. To cancel this setting, press **AUDIO** on the remote control while pressing **BAND** on it to return to the previous setting. 



⑬ VOLUME button

Press to increase or decrease the volume.

⑭ ATT button

Press to quickly lower the volume level, by about 90%. Press once more to return to the original volume level.


⑮ TUNER button

Press to select the tuner as the source.

⑯ PAUSE button

Press to turn pause on or off.

⑰ CD button

Press to select the built-in or multi-CD player as the source. 

Power ON/OFF

Turning the unit on

- **Press SOURCE to turn the unit on.**
When you select a source the unit is turned on.

Selecting a source

You can select a source you want to listen to. To switch to the built-in CD player, load a disc in this unit.

- **Press SOURCE to select a source.**

Press **SOURCE** repeatedly to switch between the following sources:

XM tuner—Tuner—Television—Built-in CD player—Multi-CD player—External unit 1—External unit 2—AUX



- In the following cases, the sound source will not change:
 - When a unit corresponding to each source is not connected to this unit.
 - When no disc is set in this unit.
 - When no magazine is set in the multi-CD player.
 - When the AUX (auxiliary input) is set to off.

- External unit refers to a Pioneer product (such as one available in the future) that, although incompatible as a source, enables control of basic functions by this unit. Two external units can be controlled by this unit. When two external units are connected, the allocation of them to external unit 1 or external unit 2 is automatically set by this unit.

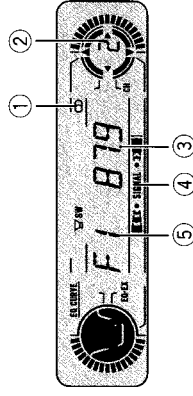
- When this unit's blue/white lead is connected to the car's auto-antenna relay control terminal, the car's antenna extends when this unit's source is turned on. To retract the antenna, turn the source off.

Turning the unit off

- **Press SOURCE and hold until the unit turns off.**

Tuner

Listening to the radio



These are the basic steps necessary to operate the radio.

① Stereo (SD) indicator

Shows that the frequency selected is being broadcast in stereo.

② Preset number indicator

Shows what preset has been selected.

③ Frequency indicator

Shows to which frequency the tuner is tuned.

④ Signal level indicator

Shows the radio wave strength.

⑤ Band indicator

Shows which band the radio is tuned to, AM or FM.

1 Press SOURCE to select the tuner.

Press **SOURCE** until you see **TUNER** displayed.

2 Use VOLUME to adjust the sound level.

Rotate to increase or decrease the volume.

3 Press BAND to select a band.

Press **BAND** until the desired band is displayed, **F1**, **F2**, **F3** for FM or **AM**.

- 4 To perform manual tuning, press **◀** or **▶** with quick presses.

The frequencies move up or down step by step.

- 5 To perform seek tuning, press and hold **◀** or **▶** for about one second and release.

The tuner will scan the frequencies until a broadcast strong enough for good reception is found.

- You can cancel seek tuning by pressing either **◀** or **▶** with a quick press.
- If you press and hold **◀** or **▶** you can skip broadcasting stations. Seek tuning starts as soon as you release the buttons.

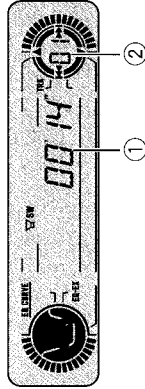


Note

When the frequency selected is being broadcast in stereo the stereo (SD) indicator will light.

Built-in CD Player

Playing a CD

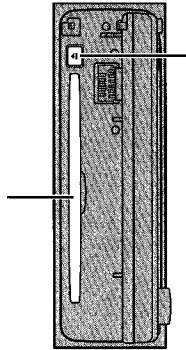


These are the basic steps necessary to play a CD with your built-in CD player.

- ① **Play time indicator**
Shows the elapsed playing time of the current track.
- ② **Track number indicator**
Shows the track currently playing.
- 1 **Press OPEN to open the front panel.**
CD loading slot appears.
 - After a CD has been inserted, press **SOURCE** to select the built-in CD player.

- 2 **Insert a CD into the CD loading slot.**
Playback will automatically start.

CD loading slot



EJECT button

- You can eject a CD by pressing **EJECT**.
 - To avoid a malfunction, make sure that no metal object comes into contact with the terminals when the front panel is open.
- 3 **Close the front panel.**

- 4 **Use VOLUME to adjust the sound level.**
Rotate to increase or decrease the volume.

- 5 **To perform fast forward or reverse, press and hold ◀ or ▶.**
 - If you select the search method to **ROUGH**, pressing and holding ◀ or ▶ enables you to search every ten track in the current disc.

- 6 **To skip back or forward to another track, press ◀ or ▶.**

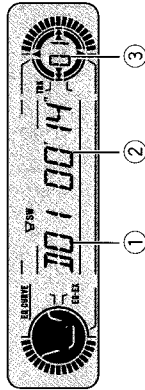
Pressing ▶ skips to the start of the next track. Pressing ◀ once skips to the start of the current track. Pressing again will skip to the previous track.

Notes

- The built-in CD player plays one, standard, 12-cm or 8-cm (single) CD at a time. Do not use an adapter when playing 8-cm CDs.
- Do not insert anything other than a CD into the CD loading slot.
- If you cannot insert a disc completely or if after you insert a disc the disc does not play, check that the label side of the disc is up. Press **EJECT** to eject the disc, and check the disc for damage before inserting the disc again.
- ▲ and ▼ can be operated when MP3 or WMA is playing.
- If the built-in CD player does not operate properly, an error message such as **ERROR-11** may be displayed. Refer to *Understanding built-in CD player error messages* on page 45.
- When a CD TEXT disc is inserted, the disc and track titles begin to scroll to the left automatically. □

Multi-CD Player

Playing a CD



You can use this unit to control a multi-CD player, which is sold separately. These are the basic steps necessary to play a CD with your multi-CD player.

- ① **Disc number indicator**
Shows the disc currently playing.
- ② **Play time indicator**
Shows the elapsed playing time of the current track.
- ③ **Track number indicator**
Shows the track currently playing.

- 1 **Press SOURCE to select the multi-CD player.**
Press **SOURCE** until you see **MULTI CD** displayed.

- 2 **Use VOLUME to adjust the sound level.**
Rotate to increase or decrease the volume.

- 3 **Select a disc you want to listen to with the 1-6 buttons.**
For discs located at 1 to 6, press the corresponding number button.
If you want to select a disc located at 7 to 12, press and hold the corresponding numbers such as **1** for disc 7, until the disc number appears in the display.
 - You can also sequentially select a disc by pressing ▲/▼.

- 4 **To perform fast forward or reverse, press and hold ◀ or ▶.**

- 5 **To skip back or forward to another track, press ◀ or ▶.**
Pressing ▶ skips to the start of the next track. Pressing ◀ once skips to the start of the current track. Pressing again will skip to the previous track.

Notes

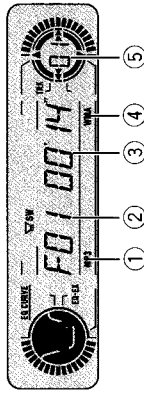
- When the multi-CD player performs the preparatory operations, **READY** is displayed.
- If the multi-CD player does not operate properly, an error message such as **ERROR-11** may be displayed. Refer to the multi-CD player owner's manual.
- If there are no discs in the multi-CD player magazine, **NO DISC** is displayed.
- When you select a CD TEXT disc on a CD TEXT compatible multi-CD player, the disc and track titles begin to scroll to the left automatically. □

50-disc multi-CD player

Only those functions described in this manual are supported for 50-disc multi-CD players. □

MP3/WMA Player

Playing a MP3/WMA



These are the basic steps necessary to play an MP3/WMA with your built-in CD player.

- ① **MP3 indicator**
Shows when the MP3 file is playing.
- ② **Folder number indicator**
Shows the folder number currently playing.
- ③ **Play time indicator**
Shows the elapsed playing time of the current track (file).
- ④ **WMA indicator**
Shows when the WMA file is playing.
- ⑤ **Track number indicator**
Shows the track (file) currently playing.
 - ▶ If a track number 100 to 199 is selected, ▶ will light up above the last two digits of the track number.
 - ▶ If a track number 200 or more is selected, ▶ will blink above the last two digits of the track number.

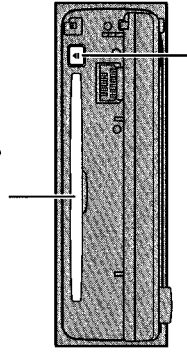
1 Press OPEN to open the front panel.

- CD loading slot appears.
- After a CD-ROM has been inserted, press **SOURCE** to select the built-in CD player.

2 Insert a CD-ROM into the CD loading slot.

Playback will automatically start.

CD loading slot



EJECT button

- You can eject a CD-ROM by pressing **EJECT**.
- To avoid a malfunction, make sure that no metal object comes into contact with the terminals when the front panel is open.

3 Close the front panel.

4 Use VOLUME to adjust the sound level.

Rotate to increase or decrease the volume.

5 Press ▲ or ▼ to select a folder.

- You cannot select a folder that does not have an MP3/WMA file recorded in it.
- To return to folder 01 (ROOT), press and hold **BAND**. However, if folder 01 (ROOT) contains no files, playback commences with folder 02.

6 To perform fast forward or reverse, press and hold ◀ or ▶.

- This is fast forward and reverse operation only for the file being played. This operation is canceled when the previous or next file is reached.
- If you select the search method to **ROUGH**, pressing and holding ◀ or ▶ enables you to search every ten track in the current folder.

7 To skip back or forward to another track, press ◀ or ▶.

Pressing ▶ skips to the start of the next track. Pressing ◀ once skips to the start of the current track. Pressing again will skip to the previous track.

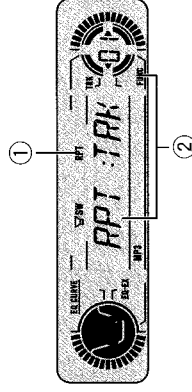
MP3/WMA Player



Notes

- When playing discs with MP3/WMA files and audio data (CD-DA) such as CD-EXTRA and MIXED-MODE CDs, both types can be played only by switching mode between MP3/WMA and CD-DA with **BAND**.
- If you have switched between playback of MP3/WMA files and audio data (CD-DA), playback starts at the first track on the disc.
- The built-in CD player can play back an MP3/WMA file recorded on CD-ROM.
- Do not insert anything other than a CD into the CD loading slot.
- There is sometimes a delay between starting up playback and the sound being issued. This is particularly the case when playing back multi-session and many folders. When being read in, **FRMTREAD** is displayed.
- If you cannot insert a disc completely or if after you insert a disc the disc does not play, check that the label side of the disc is up. Press **EJECT** to eject the disc, and check the disc for damage before inserting the disc again.
- Playback is carried out in order of file number. Folders are skipped if they contain no files. (If folder 01 (ROOT) contains no files, playback commences with folder 02.)
- When playing back files recorded as VBR (variable bit rate) files, the play time will not be correctly displayed if fast forward or reverse operations are used.
- If inserted disc contains no files that can be played back, **NO AUDIO** is displayed.
- There is no sound on fast forward or reverse.
- If the built-in CD player does not operate properly, an error message such as **ERROR-11** may be displayed.
- When an MP3/WMA disc is inserted, folder name and file name begin to scroll to the left automatically. ◀

Introduction of advanced built-in CD player (MP3/WMA) operation



① RPT indicator

Shows when repeat range is selected to current track (file).

② Function display

Shows the function status.

● Press FUNCTION to display the function names.

Press **FUNCTION** repeatedly to switch between the following functions:

- RPT** (repeat play)—**RDM** (random play)
- SCAN** (scan play)—**PAUSE** (pause)
- FF/REV** (search method)—**TAG** (tag display)
- To return to the playback display, press **BAND**.



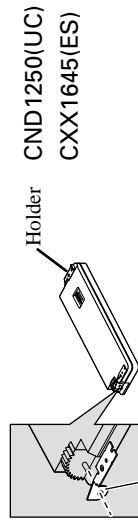
Note

If you do not operate the function within about 30 seconds, the display is automatically returned to the playback display. ◻

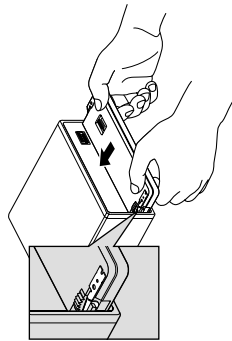
Fixing the Front Panel

If you do not operate the Detaching and Replacing the Front Panel Function, use the supplied fixing screws and fix the front panel to this unit.

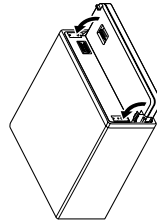
1. Attach the holders to both sides of the front panel.



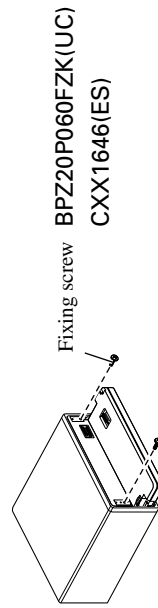
2. Replace the front panel to the unit.



3. Flip the holders into upright positions.



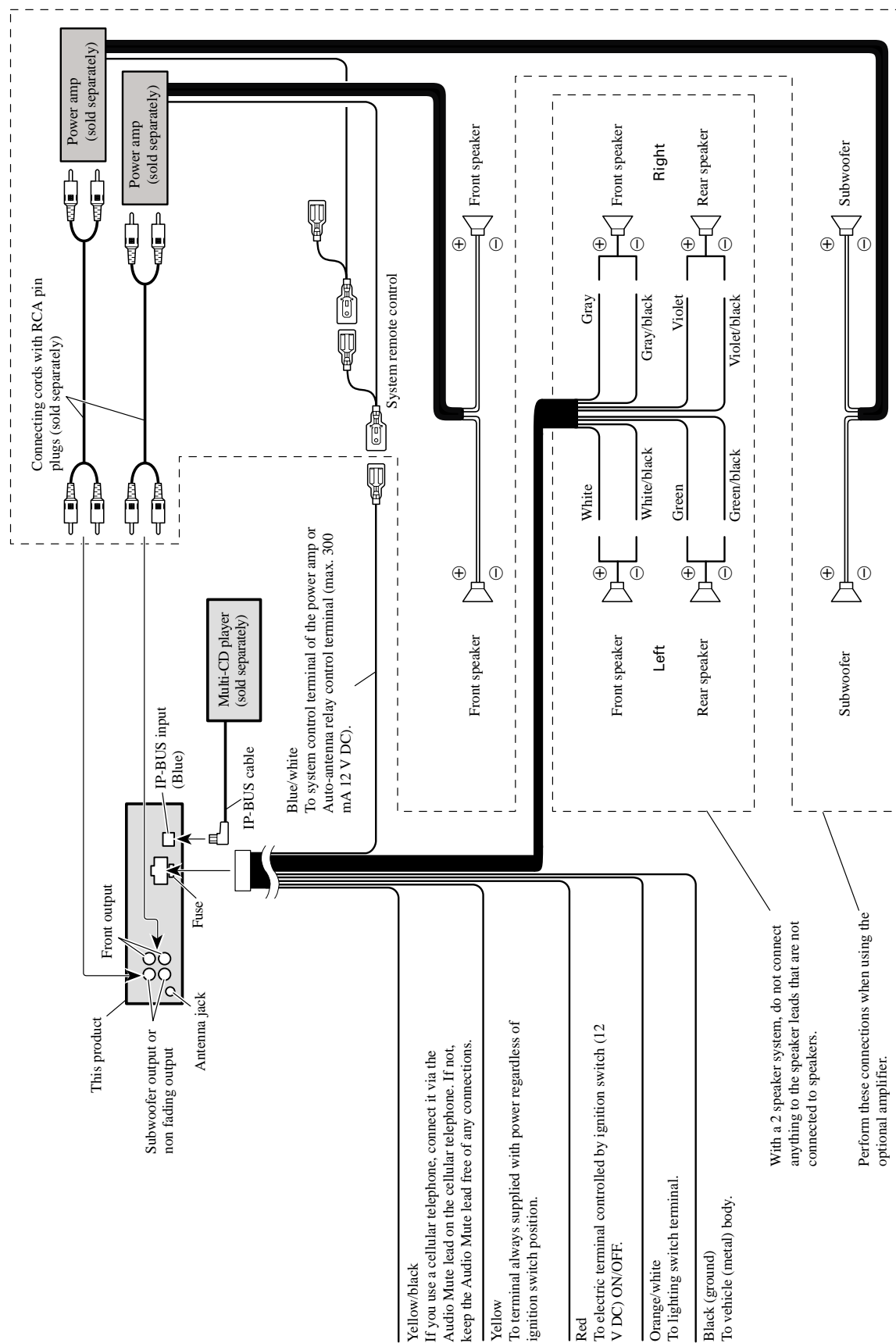
4. Fix the front panel to the unit using fixing screws.



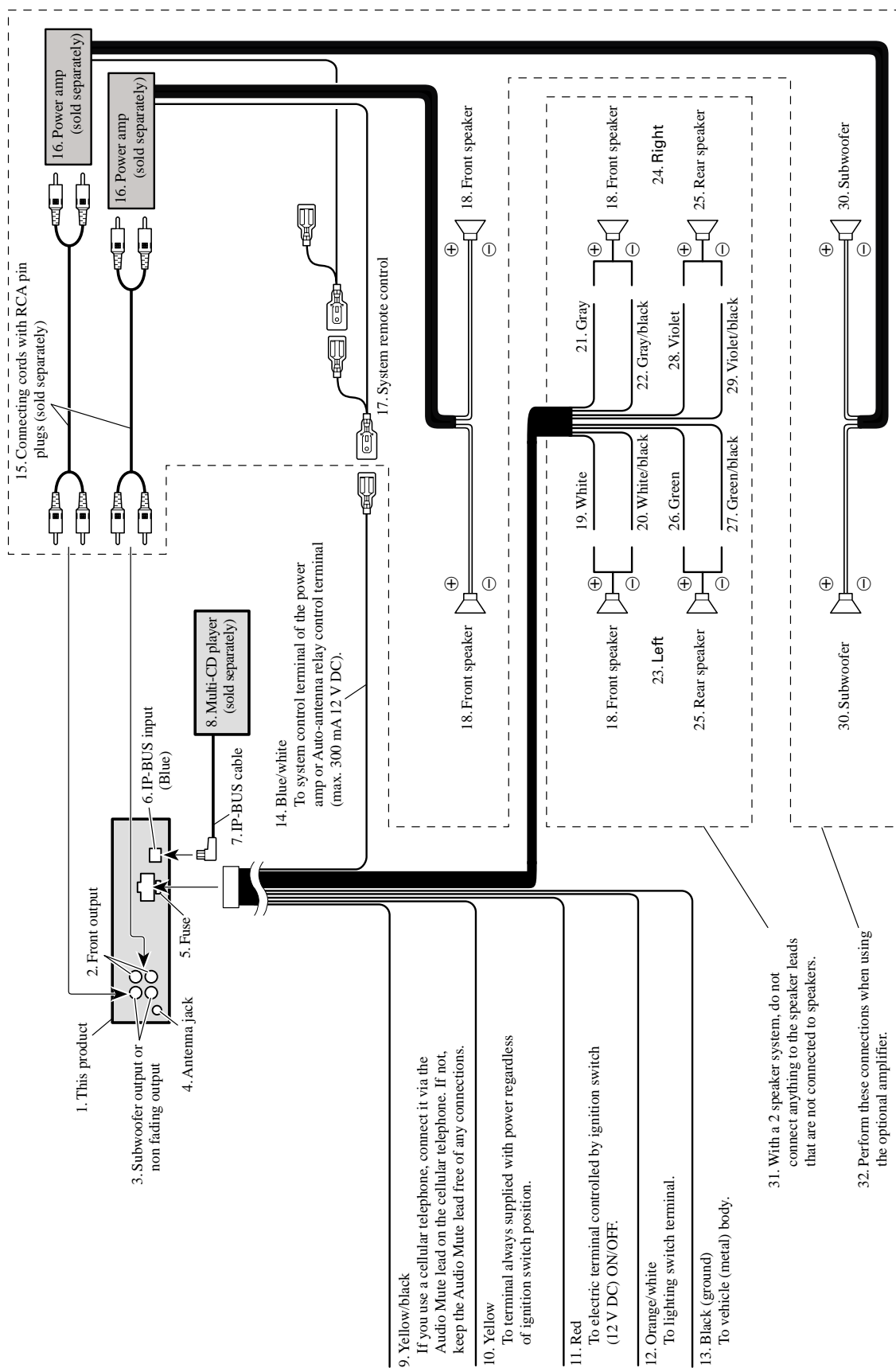
F



● CONNECTION DIAGRAM(DEH-P5500MP/XN/UC)



● CONNECTION DIAGRAM(DEH-P5550MP/XN/ES)



Service Manual

ORDER NO.
CRT3026

CD MECHANISM MODULE(S10MP3)

CX-3057

- This service manual describes the operation of the CD mechanism module incorporated in models listed in the table below.
- When performing repairs use this manual together with the specific manual for model under repair.

Model	Service Manual	CD Mechanism Module
DEH-P450MP/XM/UC DEH-P4500MP/XM/UC DEH-P3550MP/XM/ES	CRT3019	CXK5660
DEH-P3500MP/XM/EW	CRT3020	
DEH-P550MP/XN/UC DEH-P5500MP/XN/UC DEH-P5550MP/XN/ES	CRT3002	CXK5661
DEH-P5530MP/XN/EW DEH-P5500MP/XN/EW	CRT3003	

CONTENTS

1. CIRCUIT DESCRIPTIONS	2
2. MECHANISM DESCRIPTIONS.....	20
3. DISASSEMBLY	22

1. CIRCUIT DESCRIPTIONS

Recently, most CD LSI's have included DAC, RF amplifier and other peripheral circuits, as well as the core circuit DSP. This series of mechanisms employ a multi-task LSI UPD63760GJ, which has CD-ROM decoder and MP3 decoder in addition to the CD block as shown in the Fig.1.0.1. This enables to reproduce a CD-ROM where MP3 data is recorded.

Plus, in this lineup, there are WMA supported models available where WMA decoder UPD61002GC is added.

CXK5660 --- WMA non-supported

CXK5661 --- WMA supported

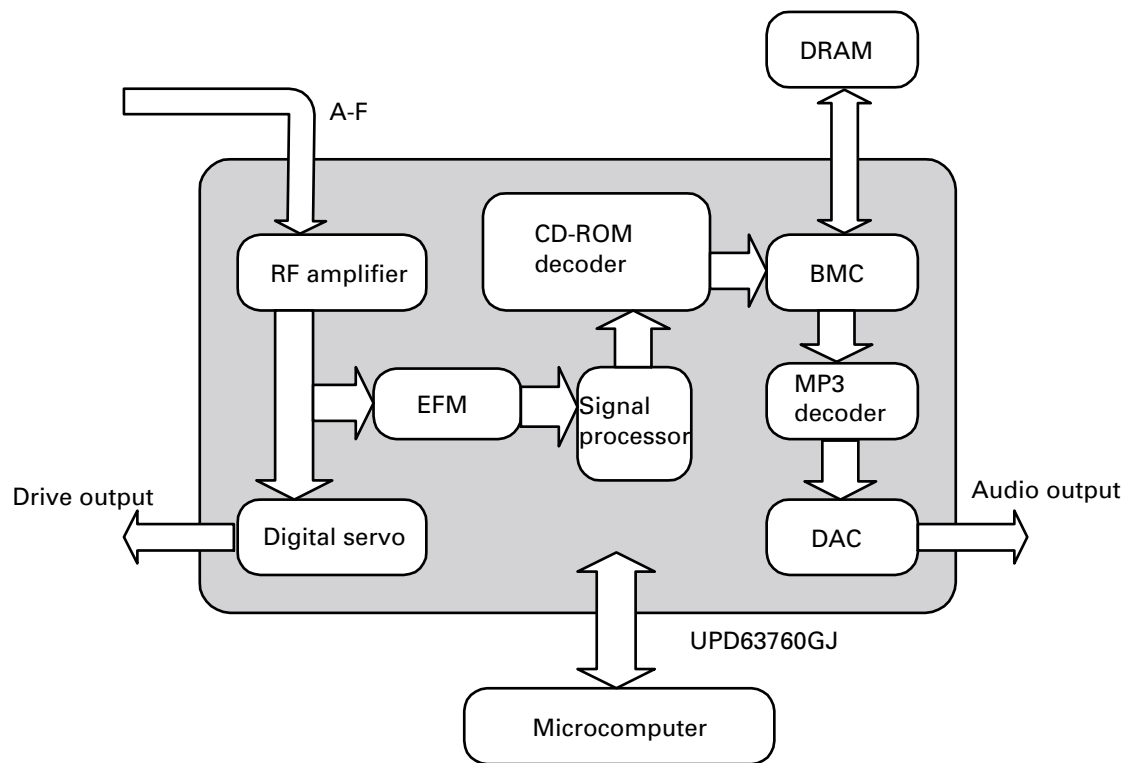


Fig.1.0.1 Block diagram of CD LSI UPD63760GJ

1.1 PREAMPLIFIER BLOCK (UPD63760GJ: IC201)

In the preamplifier block, the pickup output signals are processed to generate signals that are used for the next-stage blocks: the servo block, demodulator, and control.

After I/V-converted by the preamplifier with built-in photo detectors (inside the pickup), the signals are applied to the preamplifier block in the CD LSI UPD63760GJ (IC201). After added by the RF amplifier in this block, these signals are used to produce necessary signals such as RF, FE, TE, and TE zero-cross signals.

The CD LSI employs a single power supply system of + 3.3V. Therefore, the REFO (1.65V) is used as the reference voltage both for this CD LSI and the pickup. The LSI produces the REFO signal by using the REFOUT via the buffer amplifier and outputs from the pin 131. All the measurements should be made based on this REFO.

Caution: Be careful not to short the REFO and GRD when measuring.

1.1.1 APC (Automatic Power Control)

A laser diode has extremely negative temperature characteristics in optical output at constant-current drive. To keep the output constant, the LD current is controlled by monitor diodes. This is called the APC circuit. The LD current is calculated at about 30mA, which is the voltage between LD1 and V3R3D divided by 7.5 (ohms).

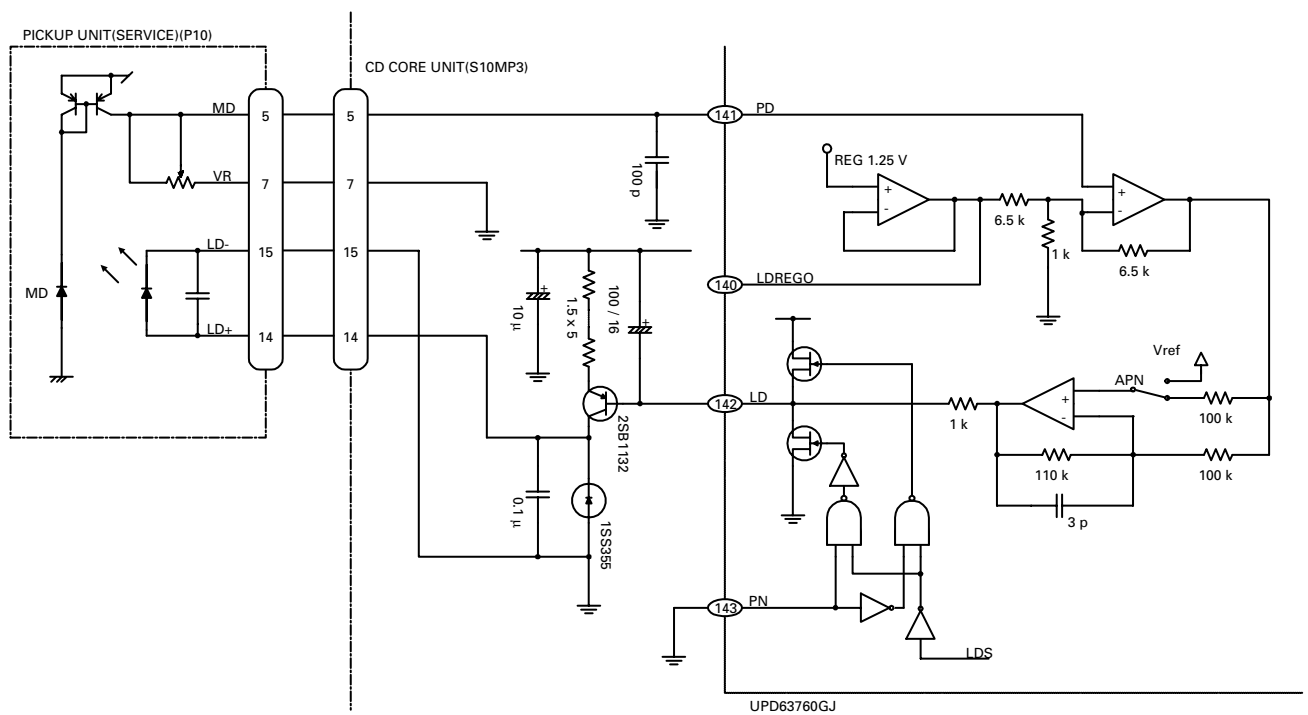


Fig. 1.1.1 APC

1.1.2 RF and RFAGC amplifiers

The photo-detector outputs (A + C) and (B + D) are added, amplified, and equalized inside this LSI, and then provided as the RF signal from the RFI terminal. The RF signal can be used for eye-pattern check.

The low frequency component of the RFO voltage is:

$$RFO = (A + B + C + D) \times 2$$

The RFO is used for the FOK generation circuit and RF offset adjustment circuit.

The RFI output from the pin 118 is A/C-coupled outside this LSI, and returned to the pin 117 of this LSI. The signal is amplified in the RFAGC amplifier to obtain the RFAGC signal. This LSI is equipped with the RFAGC auto-adjustment function as explained below. This function automatically controls the RFO level to keep at 1.5V by switching the feed-back gain for the RFAGC amplifier.

The RFO signal is also used for the EFM, DFCT, MIRR, and RFAGC auto-adjustment circuits.

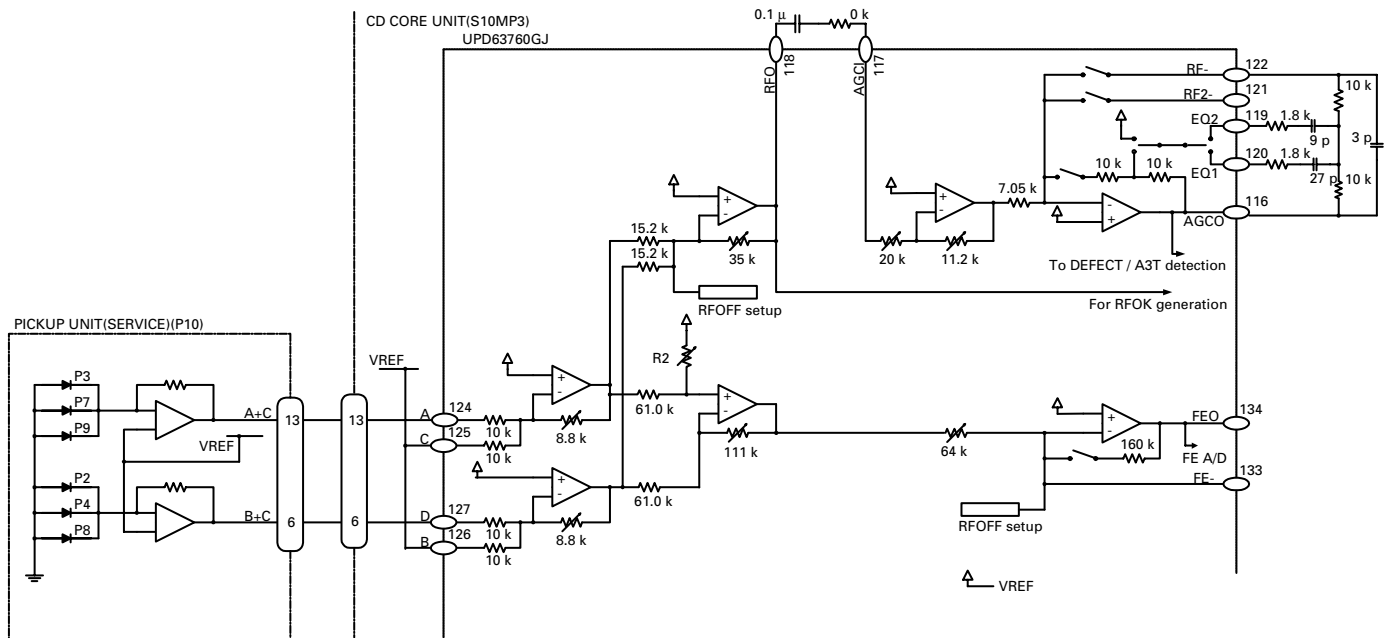


Fig. 1.1.2 RF/AGC/FE

1.1.3 Focus error amplifier

The photo-detector outputs (A + C) and (B + D) are applied to the differential amplifier and the error amplifier to obtain the (A + C - B - D) signal, which is then provided from the pin 91 as the FE signal.

The low frequency component of the FE voltage is:

$$\begin{aligned} FE &= (A + C - B - D) \times 8.8/10k \times 111k/61k \times 160k/64k \\ &= (A + C - B - D) \times 6.0 \end{aligned}$$

The FE output shows 1.5Vp-p S-shaped curve based on the REFO. For the next-stage amplifiers, the cutoff frequency is 14.6kHz.

1.1.4 RFOK

The RFOK circuit generates the RFOK signal, which indicates focus-close timing and focus-close status during the play mode, and outputs from the pin 53. This signal is shifted to "H" when the focus is closed and during the play mode.

The DC level of the RFI signal is peak-held in the digital block and compared with a certain threshold level to generate the RFOK signal. Therefore, even on a non-pit area or a mirror-surface area of a disc, the RFOK becomes "H" and the focus is closed.

This RFOK signal is also applied to the microcomputer via the low-pass filter as the FOK signal, which is used for protection and RF amplifier gain switching.

1.1.5 Tracking error amplifier

The photo-detector outputs E and F are applied to the differential amplifier and the error amplifier to obtain the (E - F) signal, and then provided from the pin 136 as the TE signal.

The low frequency component of the TE voltage is:

$$\begin{aligned} TEO &= (E - F) \times 160k/112k \times 81k/45.4k \times 160k/80k \\ &= (E - F) \times 5.1 \end{aligned}$$

The TE output provides the TE waveform of about 1.3Vp-p based on the REFO. For the next-stage amplifiers, the cut-off frequency is 21.1kHz.

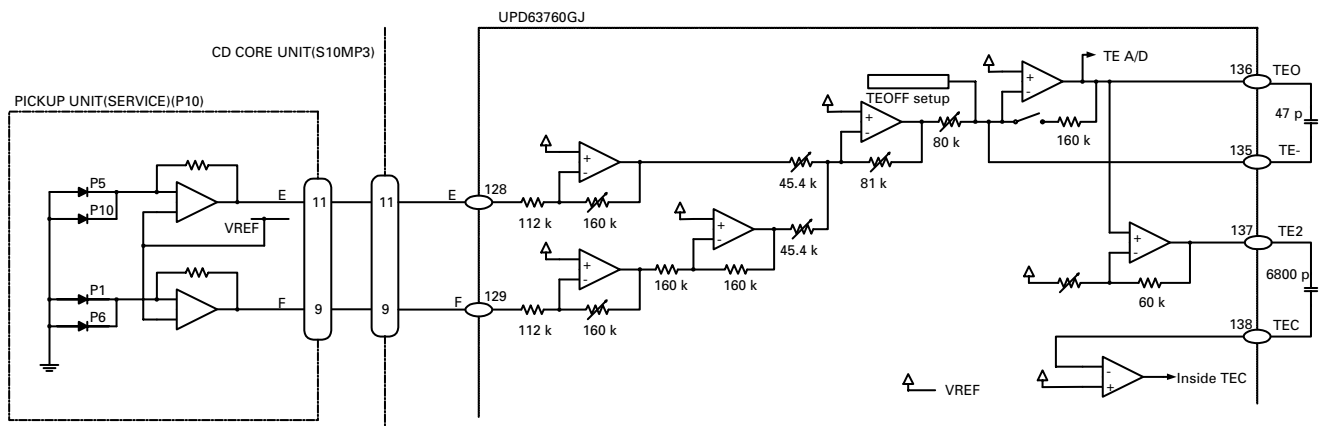


Fig. 1.1.3 TE

1.1.6 Tracking zero-cross amplifier

The tracking zero-cross signal (hereinafter TEC signal) is obtained by amplifying the TE signal 4 times, and used to detect the tracking-error zero-cross point.

By using the information on this point, the following two operations can be performed:

1. Track counting in the carriage move and track jump modes
2. Sensing the lens-moving direction at the moment of the tracking close (The sensing result is used for the tracking brake circuit as explained below.)

The frequency range of the TEC signal is between 300Hz and 20kHz.

TEC voltage = TE level x 4

The TEC level can be calculated at 5.2V. This level exceeds the D range of the operational amplifier, and the signal gets clipped. However, it can be ignored because the CD LSI only uses the signal at the zero-cross point.

1.1.7 EFM

The EFM circuit converts the RF signal into a digital signal expressed in binary digits 0 and 1. The AGCO output from the pin 116 is A/C-coupled in the peripheral circuit, fed back to the LSI from the pin 115, and sent to the EFM circuit inside the LSI.

On scratched or dirty discs, part of the RF signal recorded may be missing. On other discs, part of the RF signal recorded may be asymmetric, which was caused by dispersion in production quality. Such lack of information cannot be completely eliminated by this AC coupling process. Therefore, by utilizing the fifty-fifty occurrence ratio of binary digits (0 and 1) in the EFM signal, the EFM comparator reference voltage ASY is controlled, so that the comparator level always stays around the center of the RFO signal. The reference voltage ASY is made from the EFM comparator output via the low-pass filter. The EFM signal is put out from the pin 111.

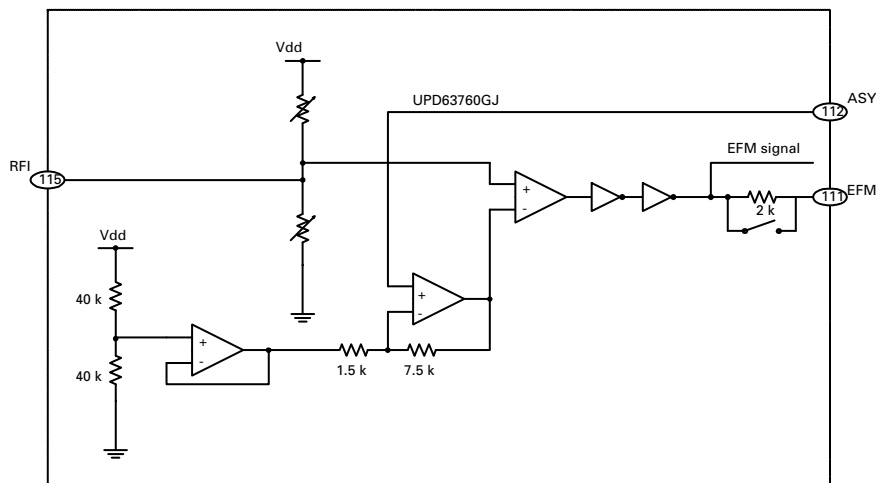


Fig. 1.1.4 EFM

1.2 SERVO BLOCK (UPD63760GJ: IC201)

The servo block controls the servo systems for error signal equalizing, in-focus, track jump and carriage move and so on. The DSP block is a signal-processing block, where data decoding, error correction, and compensation are performed.

After A/D-converted, the FE and TE signals (generated in the preamplifier block) are applied to the servo block and used to generate the drive signals for the focus, tracking, and carriage servos.

The EFM signal is decoded in the DSP block, and finally sent out as the audio signal after D/A-converted. In this decoding process, the spindle servo error signal is generated, supplied to the spindle servo block, and used to generate the spindle drive signal.

The drive signals for focus, tracking, carriage, and spindle servos (FD, TD, SD, and MD) are provided as PWM3 data, and then converted to the analog data by the low-pass filter which uses the operational amplifier embedded in the driver IC BA5996FM (IC301). These analog drive signals can be monitored by the FIN, TIN, CIN, and SIN signals respectively. Afterwards, the signals are amplified and applied to each servo's actuator and motor.

1.2.1 Focus servo system

In the focus servo system, the digital equalizer block works as its main equalizer. The figure 1.2.1 shows the block diagram of the focus servo system.

To close the focus loop circuit, the lens should be moved to within the in-focus range. While moving the lens up and down by using the focus search triangular signal, the system tries to find the in-focus point. In the meantime, the spindle motor rotation is kept at the prescribed one by using the kick mode.

The servo LSI monitors the FE and RFOK signals and automatically performs the focus close operations at an appropriate timing. The focus loop will close when the following three conditions are satisfied at the same time:

- 1) The lens moves toward the disc surface.
- 2) The RFOK signal is shifted to "H".
- 3) The FE signal is zero-crossed. At last, the FE signal comes to the zero level (or REFO).

When the focus loop is closed, the FSS bit is shifted from "H" to "L". The microcomputer starts monitoring the RFOK signal obtained through the low-pass filter 10msec after that.

If the RFOK signal is detected as "L", the microcomputer will take several actions including protection.

The timing chart for focus close operations is shown in fig. 1.2.2.

In the test mode, the S-shaped curve, search voltage, and actual lens movement can be confirmed by pressing the focus close button when the focus mode selector displays 01.

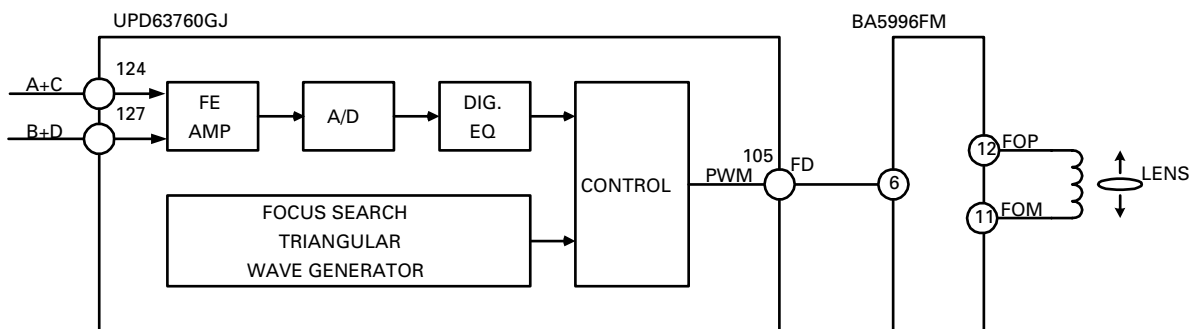


Fig. 1.2.1 Block diagram of the focus servo system

A

B

C

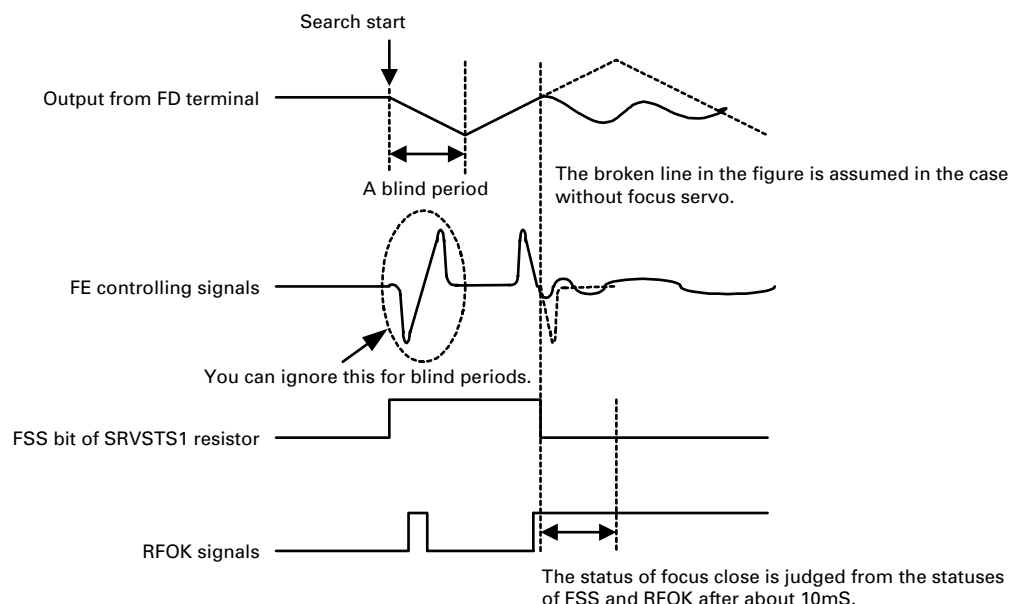


Fig. 1.2.2 Timing chart for focus close operations

1.2.2 Tracking servo system

In the tracking servo system, the digital equalizer block is used as its main equalizer. The figure 1.2.3 shows the block diagram of the tracking servo system.

(a) Track jump

Track jump operation is automatically performed by the auto-sequence function inside the LSI with a command from the microcomputer. In the search mode, the following five track jump modes are available: 1, 4, 10, 32, and 32*3

In the test mode, 1, 32, and 32*3 track jump modes, and carriage move mode are available and can be switched by selecting the mode.

For track jumps, first, the microcomputer sets about half the number of tracks to be jumped as the target. (Ex. For 10 track jumps, it should be 5 or so.) Using the TEC signal, the microcomputer counts up tracks. When the counter reaches the target set by the microcomputer, a brake pulse is sent out to stop the lens. The pulse width is determined by the microcomputer. Then, the system closes the tracking loop and proceeds to the normal play. At this moment, to make it easier to close the tracking loop, the brake circuit is kept ON for 50msec after the brake pulse, and the tracking servo gain is increased.

In the normal operation mode, the FF/REW operation is realized by continuously repeating single jumps about 10 times faster than the normal single jump operation.

(b) Brake circuit

The brake circuit stabilizes the servo-loop close operation even under poor conditions, especially in the setting-up mode or track jump mode. This circuit detects the lens-moving direction and emits only the drive signal for the opposite direction to slow down the lens. Thus, this makes it easier to close the tracking servo loop. The off-track direction is detected from the phases of the TEC and MIRR signals.

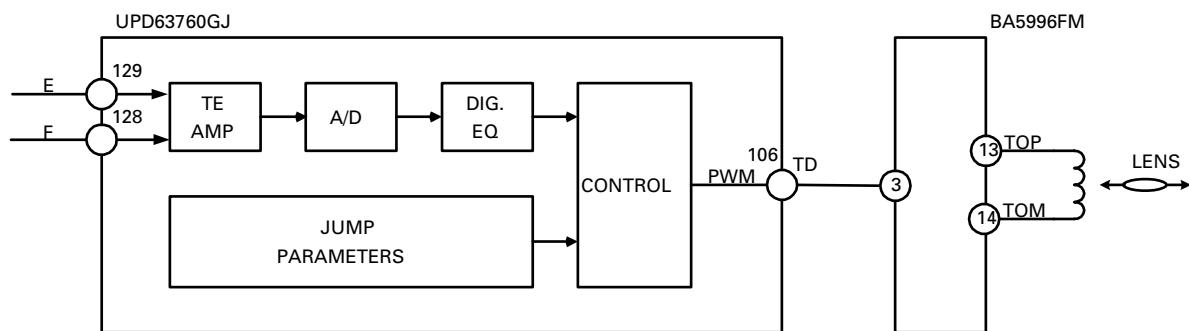


Fig. 1.2.3 Block diagram of the tracking servo system

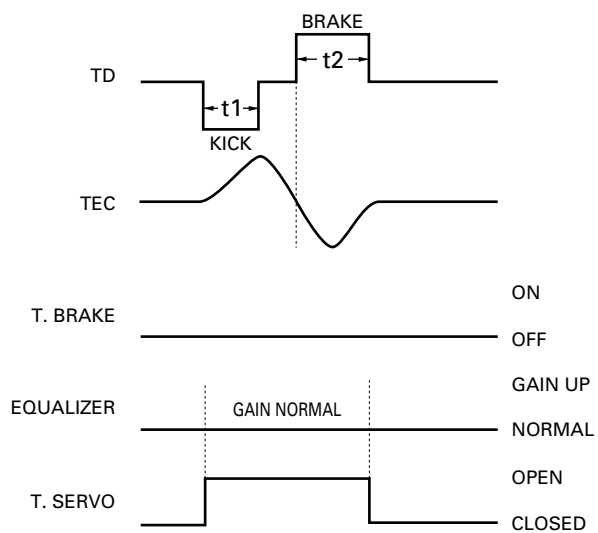


Fig. 1.2.4 Single-track jump

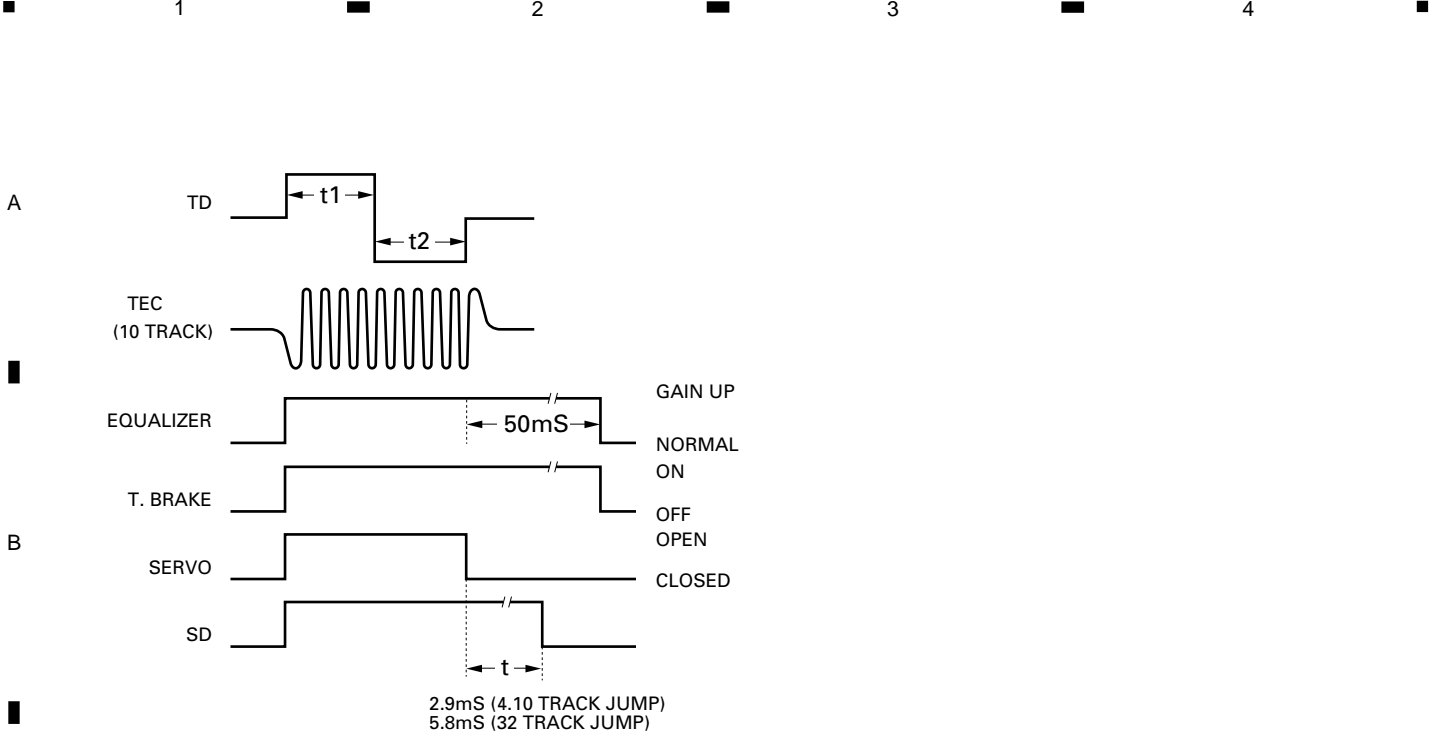
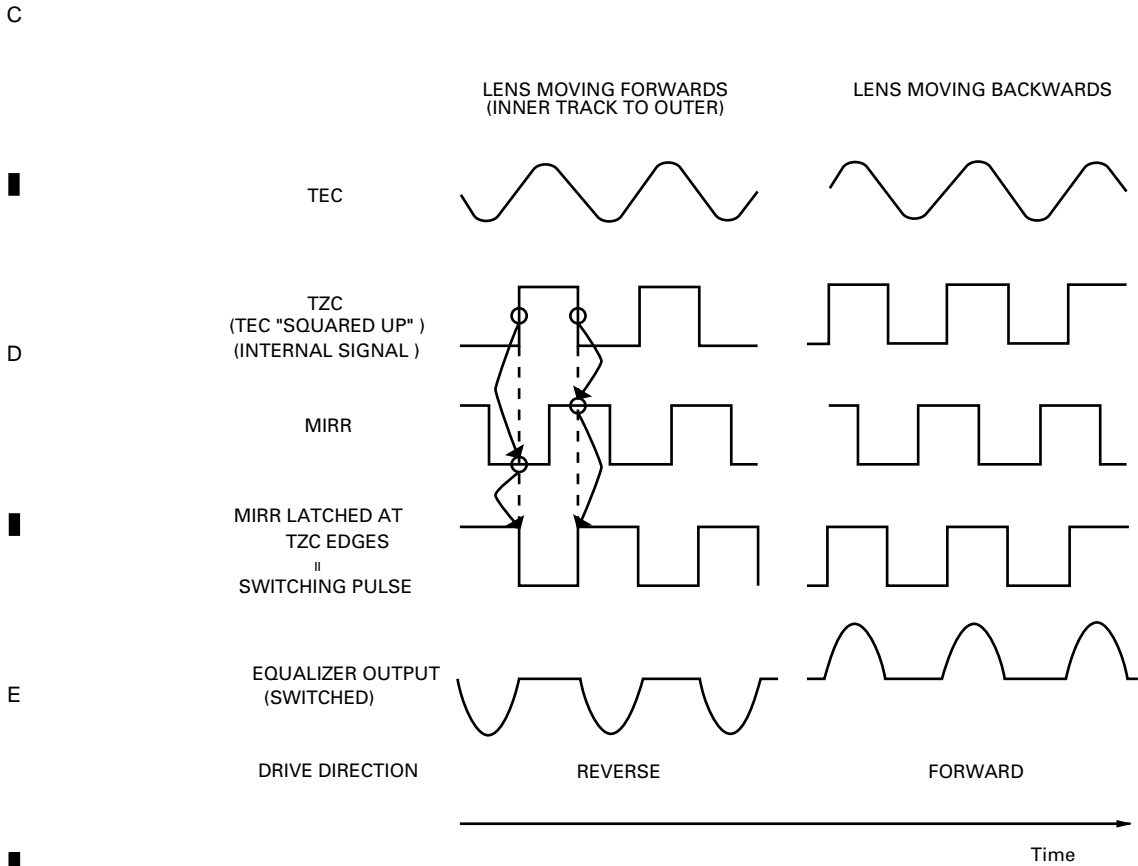


Fig. 1.2.5 Multi-track jump



Note : Equalizer output assumed to have same phase as TEC.

Fig. 1.2.6 Track brake

1.2.3 Carriage servo system

In the carriage servo system, the low frequency component from the tracking equalizer (the information on the lens position) is transferred to the carriage equalizer, where the gain is increased to a certain level, and then sent out from the LSI as the carriage drive signal. This signal is applied to the carriage motor via the driver IC.

During the play mode, when the lens offset reaches a certain level, it is necessary to move the pickup toward the FORWARD direction. The equalizer gain is adjusted so that the output over the carriage motor starting voltage is sent out in such a case. In actual operations, only when the equalizer output exceeds the threshold level preset in the servo LSI, the drive signal is sent out. This can reduce the consumption power.

With an eccentric disc loaded, before the whole pickup starts moving, the equalizer output may exceed the threshold level a few times. In this case, the drive signal applied from the LSI shows pulse-like waveforms.

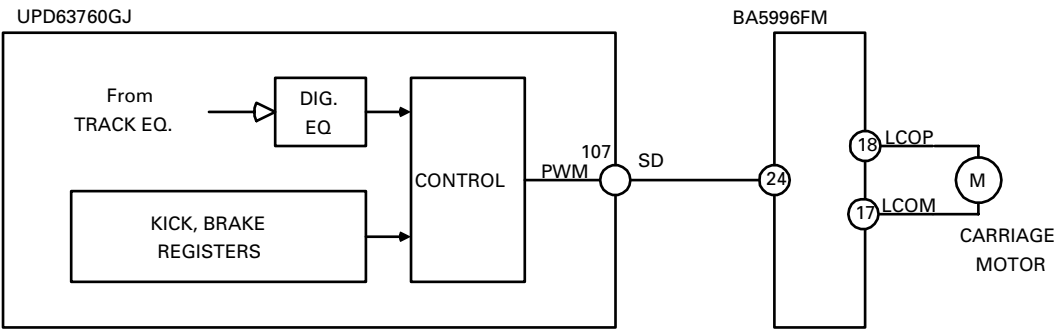


Fig. 1.2.7 Block diagram for the carriage servo block

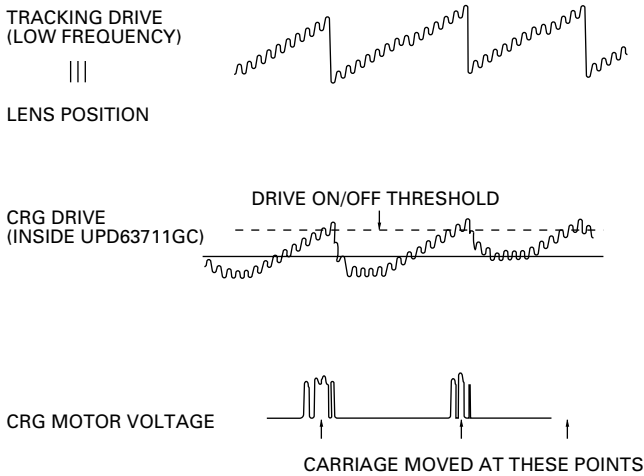


Fig. 1.2.8 Waveforms of the carriage signal

1.2.4 Spindle servo system

In the spindle servo system, the following seven modes are available:

1) Kick

Used to accelerate the disc rotation in the setting-up mode.

2) Offset

a. Used in the setting-up mode until the AGC completes after the kick mode.

b. Used when the focus loop is unlocked during the play mode and until it is locked again.

In both cases, the mode is to keep the disc rotation near to the appropriate one.

3) Applicable servo

In the normal operation, the CLV servo mode is used.

The EFM demodulation block detects through WFK/16 sampling whether or not the frame sync signal and the internal frame counter output are synchronized, and generates the status signal based on the sampling result, synchronized or non-synchronized. If eight consecutive "non-sync" signals are obtained, the system senses the status as "non-sync". If not, the system senses as "sync". In the applicable servo mode, the leading-in servo mode is automatically selected at the non-sync status, and the normal servo mode is at the sync status.

4) Brake

Used to stop the spindle motor.

In accordance with the microcomputer's command, the brake voltage is sent out from the servo LSI. At this moment, the EFM waveform is being monitored in this LSI. When the longest EFM pattern exceeds a certain cycle (or the rotation slows down enough), a flag is set inside the LSI, and the microcomputer switches off the brake voltage. If a flag is not set within a certain period, the microcomputer shifts the mode from the brake mode to the stop mode, and keeps this for a certain period. In the eject mode, after the mode is shifted to the stop mode and a certain period passes, the loaded disc is ejected.

5) Stop

Used when the power is turned on and during the eject mode. At this moment, the voltage through the spindle motor is 0V.

6) Rough servo

Used when the carriage is moved (or in the carriage move mode such as long search).

By obtaining the linear velocity from the EFM waveform, "H" or "L" is applied to the spindle equalizer. In the test mode, this mode is used for grating confirmation.

7) Rotation speed

CD-DA and CD-ROM are controlled differently at their rotation speeds. Both of them are done by the double speed in the setting-up mode when a disc gets inserted. However, CD-DA is done by the standard speed in the setting-up mode starting from SOURCE ON/ACC ON with the disc inside, while CD-ROM is still done by the double speed. During the play mode, the rotation speed of CD-DA is always the standard speed, while that of CD-ROM is always the double speed.

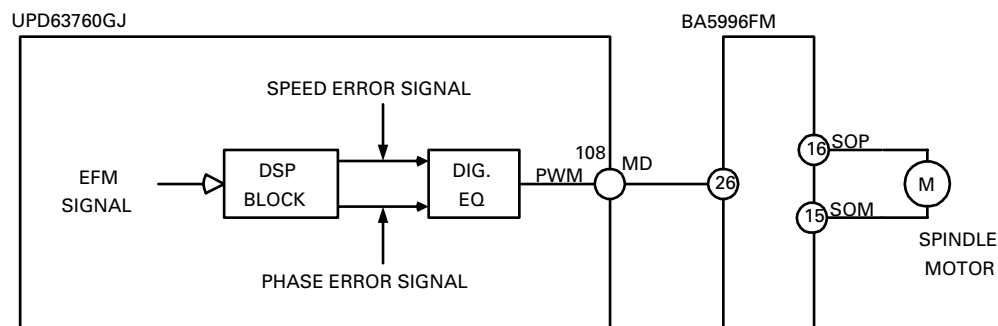


Fig.1.2.9 Block diagram of the spindle servo system

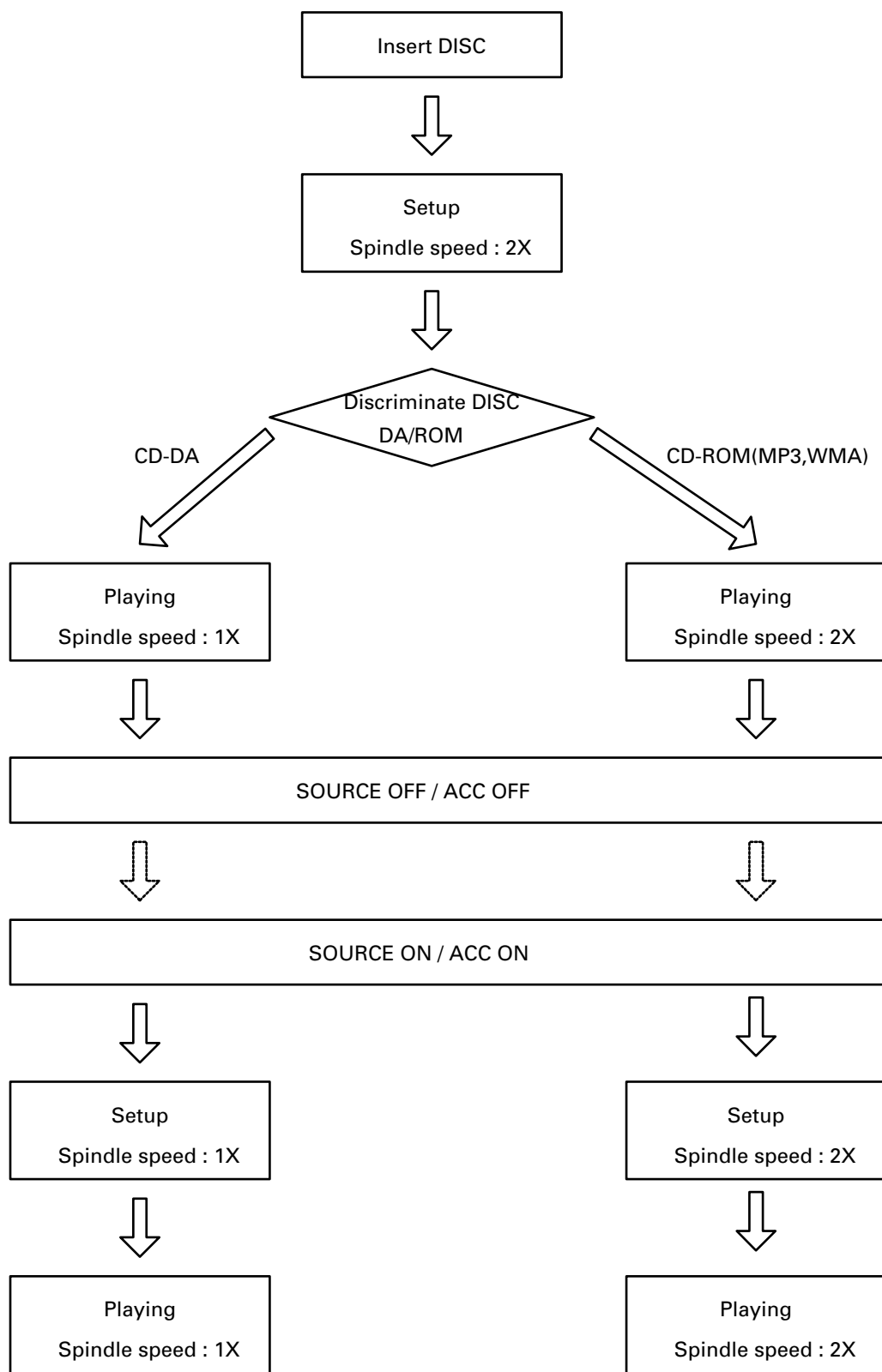


Fig.1.2.10 Dual spindle drive(x1 / x2)

1.3 AUTOMATIC ADJUSTMENT FUNCTION

This system automatically handles the circuit adjustment inside the CD LSI. All adjustments are performed whenever a disc is inserted or the CD mode is selected by pressing the source key. Each adjustment will be explained below.

1.3.1 TE, FE, and RF offset auto-adjustment

This adjustment is made to adjust the offsets of the TE, FE, and RF amplifiers in the preamplifier block to their target values on the basis of the REFO when the power is turned on. (The target values for TE, FE, and RE offsets are 0V, 0V, and -0.8V respectively.)

<Adjusting procedures>

- 1) With the LD OFF status, the microcomputer reads each offset through the servo LSI.
- 2) The microcomputer calculates the voltages for correction from the measured values, and inputs the calculated results as the offset adjustment values.

1.3.2 Tracking balance (T.BAL) auto-adjustment

This adjustment is to equalize the pickup output offsets for E-ch and F-ch by changing the amplifier gain inside the LSI. Actually, the gain is adjusted so that the TE waveform becomes symmetrical on each side of the REFO.

<Adjusting procedures>

- 1) The focus loop is closed.
- 2) The lens is kicked in the radial direction to make certain that the TE waveform is generated.
- 3) The microcomputer reads the TE offset calculated in the LSI through the servo LSI.
- 4) The microcomputer takes either of the following steps depending on the calculated offset:
 - When the offset is 0, the adjustment completes.
 - When the offset is positive or negative, the amp gains for E-ch and F-ch should be changed.

The steps 2) to 4) are repeatedly taken until the offset becomes 0 or the repeating time reaches the limit frequency.

1.3.3 EF bias auto-adjustment

This adjustment obtains the best focus point during the play mode and maximizes the RFI level by utilizing the phase difference between the 3T level of the RF signal and that of the signal obtained when focus error disturbance is applied to the focus loop. At this moment, the auto-gain control (AGC), where focus error disturbance is applied to the focus and tracking loops, is also performed as explained below.

<Adjusting procedures>

- 1) The microcomputer transmits the command to apply disturbance component to the focus loop (inside the servo LSI).
- 2) In the LSI, the 3T-offset component of the RF signal is detected.
- 3) From the relation between the 3T detected component and the disturbance, the LSI obtains the volume and direction of the focus offset.
- 4) The microcomputer transmits the command and reads out the detecting result from the servo LSI.
- 5) The microcomputer calculates the necessary correction and inputs the result as the bias adjustment value to the servo LSI.

The adjusting steps are repeated a few times for higher adjustment accuracy as same as those for the AGC.

1.3.4 Focus and tracking AGC

This function automatically adjusts the focus and tracking servo loop gains.

<Adjusting procedures>

- 1) Disturbance component is applied to the servo loop.
 - 2) The error signals (FE and TE) are extracted through the band pass filter as the G1 and G2 signals.
 - 3) The microcomputer reads the G1 and G2 signals through the servo LSI.
 - 4) The microcomputer calculates the necessary correction and performs the loop gain adjustment inside the servo LSI.
- For higher adjustment accuracy, the above steps are repeated a few times.

1.3.5 RF level auto-adjustment (RFAGC)

This adjustment minimizes the dispersion of the RF level (RFO), which may be caused by disc-related errors, for more stable signal transmission by changing the amp gain between RFI and RFO.

<Adjusting procedures>

- 1) The microcomputer sends the command to the servo LSI to read out the output from the RF level detecting circuit inside the servo LSI.
- 2) The microcomputer calculates the appropriate amp gain by using the output read out to adjust the RFO level at the prescribed one.
- 3) The microcomputer sends the command to the servo LSI to adjust the amp gain into the calculated one.

This adjustment is automatically performed when:

- 1) During the setting-up mode, only the focus close operation ends.
- 2) Immediately before the setting-up ends (or right before the play mode starts)
- 3) During the play mode, the focus loop is locked again after unlocked.

1.3.6 Preamplifier gain adjustment

In this adjustment, when the reflected beams from disc surface are extremely weak (ex. when the lens is dirty, and a CD-RW is loaded), the whole gain in the RFAMP block (FE, TE, and RF amplifiers) is increased by +6dB or +12dB.

<Adjusting procedures>

When the system senses that the reflected beams from disc surface are extremely weak during the setting-up mode, the whole RFAMP gain is increased by +6dB or +12dB.

After the gain is changed, the setting-up mode is restarted.

If the whole RFAMP gain is always increased to the +6dB level in the play mode, the +6dB level will be employed at the starting of the setting-up mode from the next playback.

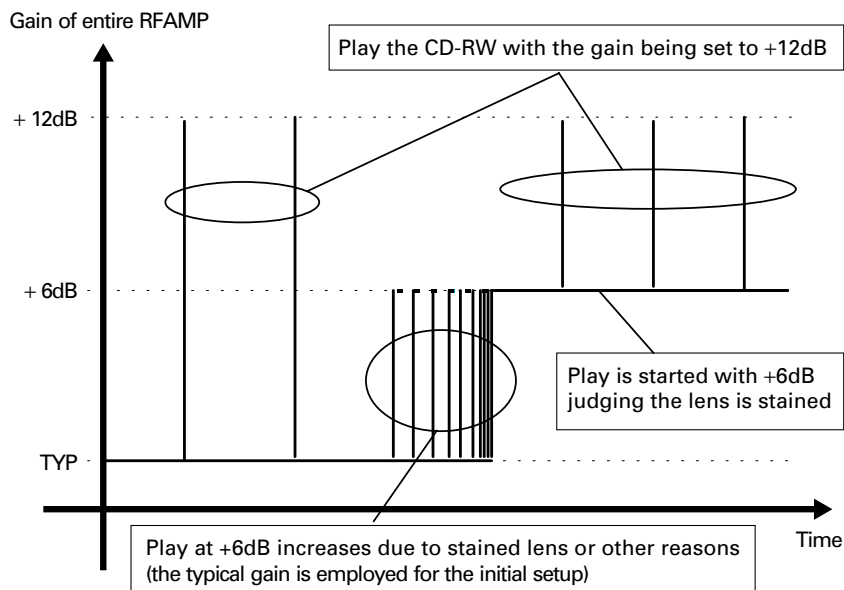


Fig.1.3.1 Pre-amp gain adjustment

1.3.7 Initial values in adjustment

For each auto-adjustment, the last adjustment results are basically used as the initial settings of the next adjustment unless the microcomputer is turned off (or the backup is off). When the microcomputer (or the backup) is turned off, the last adjustment results are not used, but the factory settings.

1.3.8 Adjustment result display

For some of the adjustments (FE and RF offset, FZD cancel, F and T gain, and RFAGC), the adjustment results can be displayed and confirmed in the test mode.

1) FE and RF offset

Reference coefficient = 32 ("32" indicates no adjustment required)

The display is expressed in the unit of about 32mV.

Ex. When the FE offset coefficient is 35:

$$35 - 32 = 3 \times 32\text{mV} = 96\text{mV}$$

This means that the correction is about +96mV, and the FE offset before adjustment is -96mV.

2) F and T gain adjustment

Reference coefficient for focus and tracking = 20

The displayed coefficient / the reference coefficient indicates the adjusted gain.

Ex. When the AGC coefficient is 40:

$$40/20 = 2 \text{ times (+6dB)}$$

That is, the gain was adjusted by +6dB.

(The original loop gain was half the target one. So, the whole gain was doubled.)

3) RF level adjustment (RFAGC)

Reference coefficient = 8

The coefficient 9 to 15 indicates increasing the RF level.

The coefficient 0 to 7 indicates decreasing the RF level.

When the coefficient display changes by 1, the gain changes by 0.7 to 1dB.

When the coefficient is 15, the gain is maximum or TYP + 6.5dB.

When the coefficient is 0, the gain is minimum or TYP - 6.0dB.

1.4 POWER SUPPLY AND LOADING BLOCK

The VD ($8.3 \pm 0.5V$), the VD2 ($5.6 \pm 0.5V$) and the VDD ($5.0 \pm 0.25V$), which are supplied from the mother PC board, are used for the power supply. In this system, the following four power-supply signals are available: the VD (for the drive system), the V3R3 obtained from the VD2 via the 3.3V regulator (for the control system: 3.3V), the VDD (for the microcomputer: 5V), and the 3VDD obtained from the VDD via the 3.3V regulator (for the microcomputer: 3.3V).

In the WMA-supported mechanism CXK5661, the V2R5 obtained from the VD2 via the 2.5V regulator (for WMA decoder: 2.5V) is also used.

The microcomputer can turn on/off the CD driver (except for the load and eject modes) and the 3.3V signal by controlling the "CONT" and "CD3VON" signals respectively. To turn on/off the loading drive, there is no control terminal in the microcomputer, but the "LOEJ" input signal works as the control one. In the LCO output block, the "CLCONT" signal is used to switch between the loading mode and carriage mode.

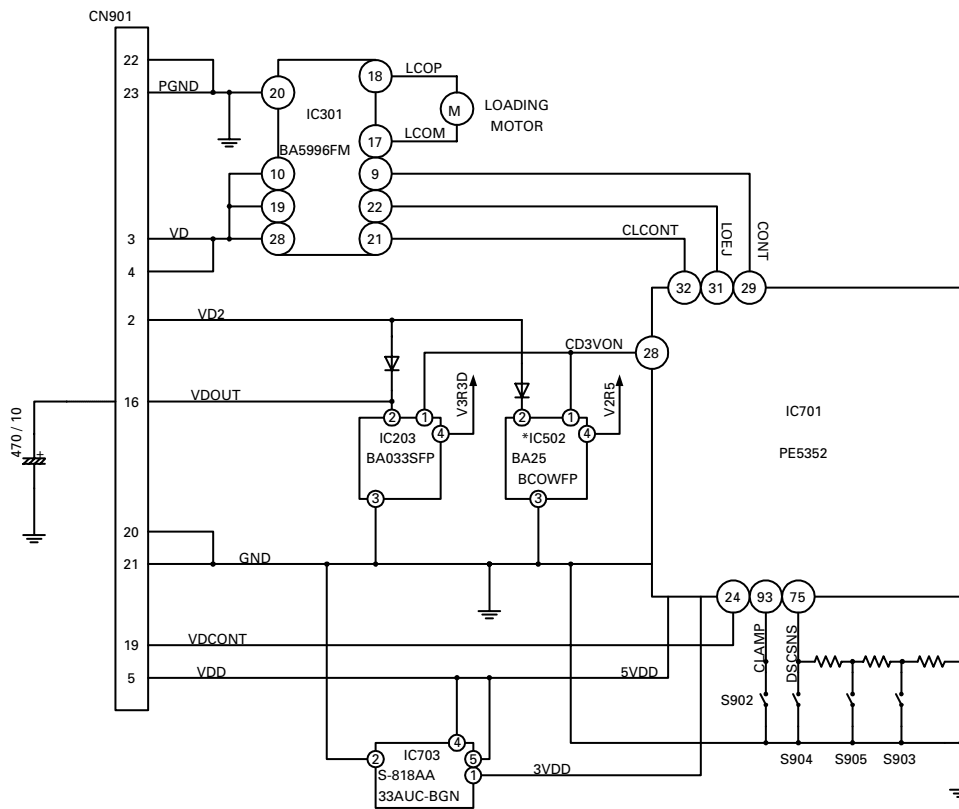


Fig. 1.4.1 Power supply/loading block (*: CXK5661)

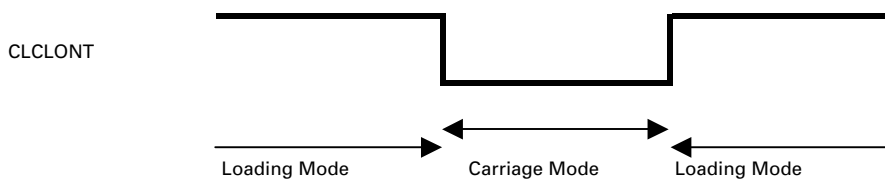


Fig. 1.4.2 Loading/carriage mode shift

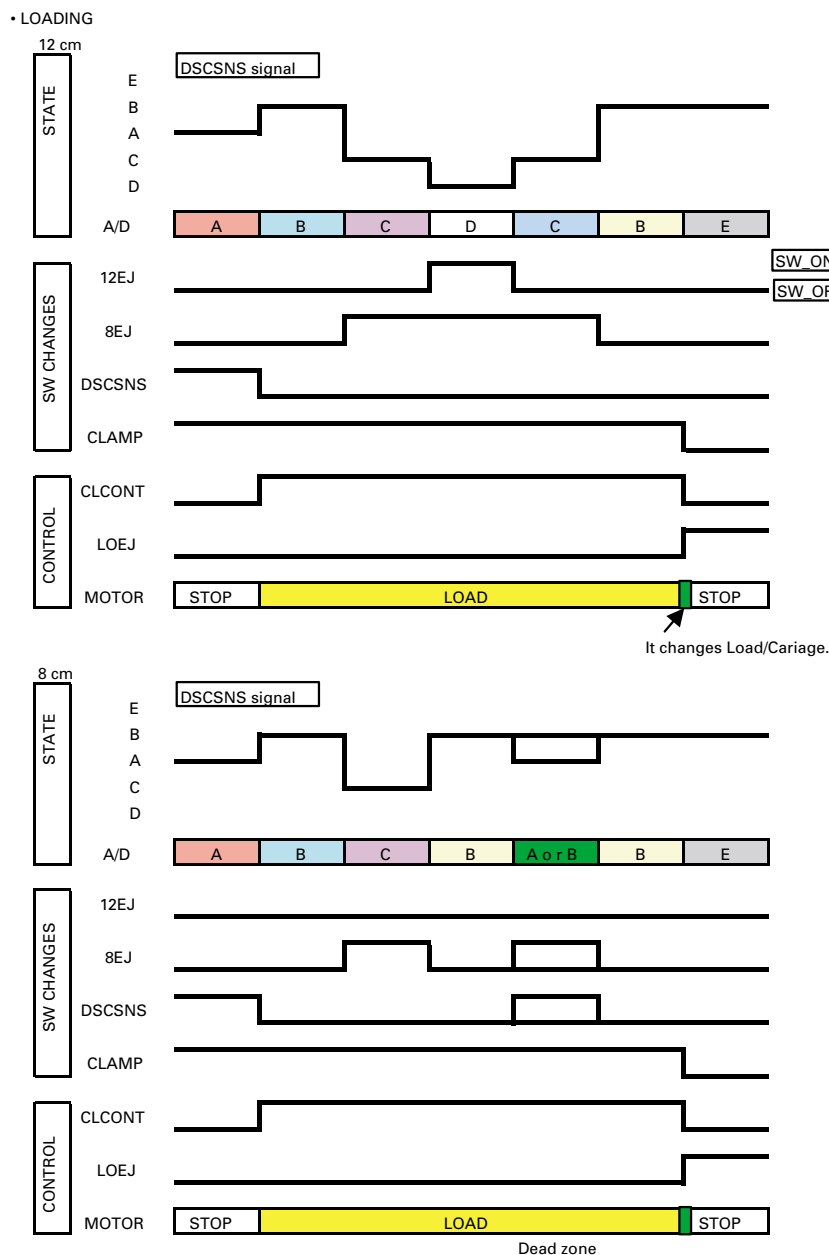
To control the load and eject operations, the clamp switch located in the mechanism unit and the three detecting switches located in the control unit are used. Depending on the combination of these switches' ON/OFF status, the DSCSNS voltage changes.

The microcomputer can detect the status (A to E) by observing the voltage at the A/D port. The disc size detection (8 or 12cm) is also performed through this status change. The DSCSNS status and the status change in the load and

Status	A	B	C	D	E
SW1 S904	0	0	0	1	0
SW2 S905	0	0	1	1	0
SW3 S903	1	0	0	0	0
SW4 S902	1	1	1	1	0
Mecha	No DISC				CLMP

eject modes are shown in the figures 1.4.3 and 1.4.4 respectively.

Fig.1.4.3 DSCSNS status



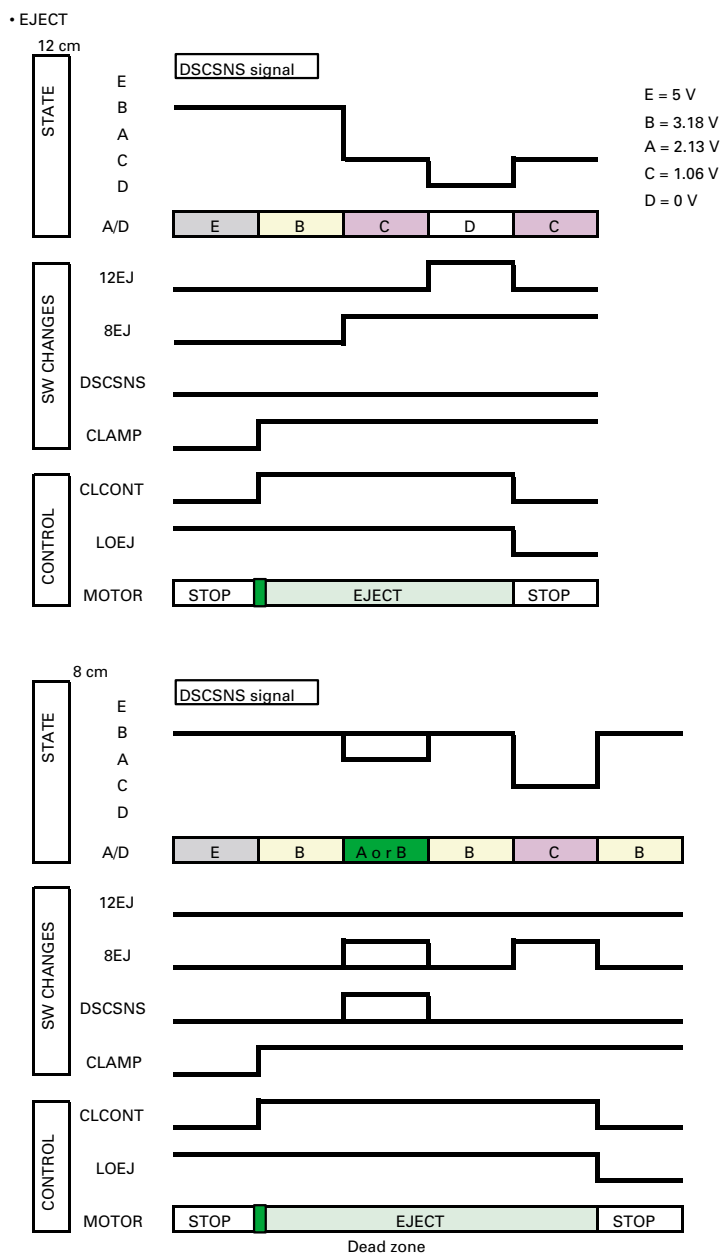
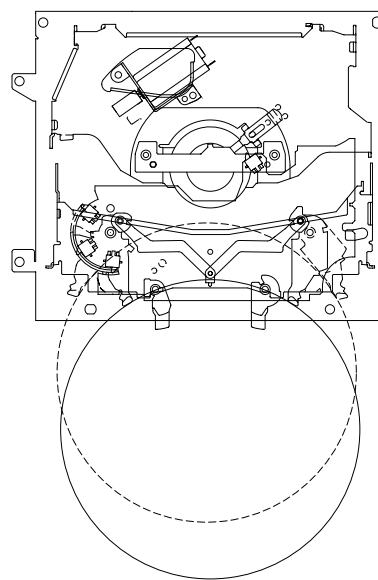
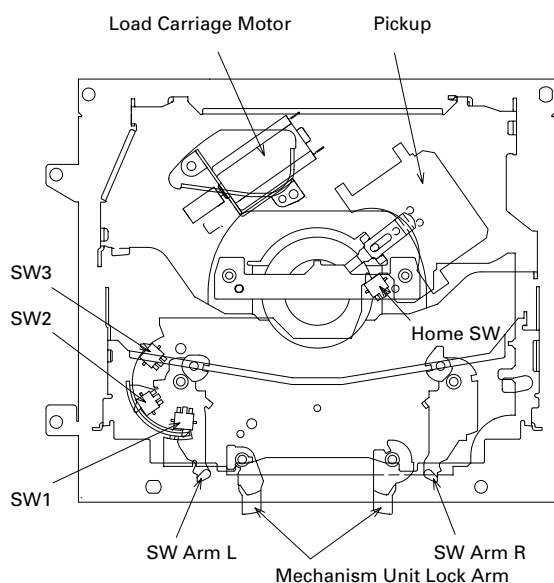


Fig.1.4.4 Status change in LOAD and EJECT modes

2. MECHANISM DESCRIPTIONS

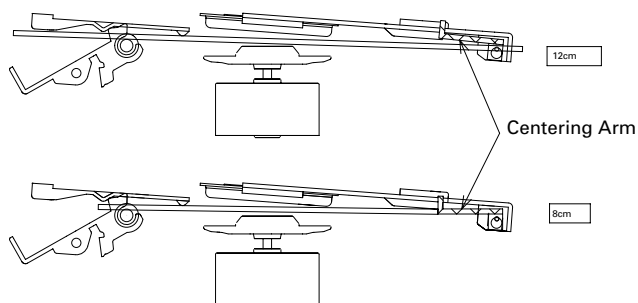
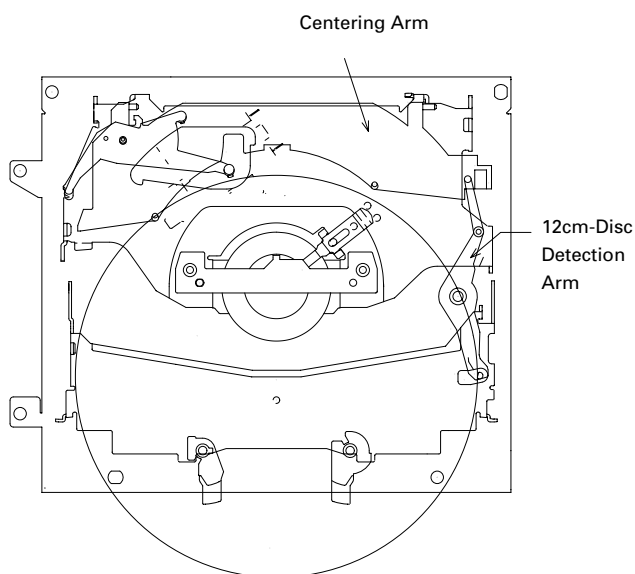
● Loading actions

1. When a disc is inserted, SW Arm L and R rotate. Due to the rotation of Arm L, SW1 is switched from ON to OFF and the Load Carriage Motor starts.
 2. If the disc is 12cm-disc, when it is carried to the position shown with the dotted line in the drawing, SW 3 switches to ON due to such rotation of Arm. Then, the microcomputer judges that the disc is 12cm-disc.
 3. In case of 8cm-disc, the disc cannot reach such dotted line position, and from such limitation of approach, the microcomputer judges that the disc is 8cm-disc and simply triggers clamp actions.
- (Movement of SW Arm L and R are connected together. So, if pushing force is fed to only one arm, the distance between tow arms cannot be widened beyond the specific degree, because the coupling part is locked in such case.)



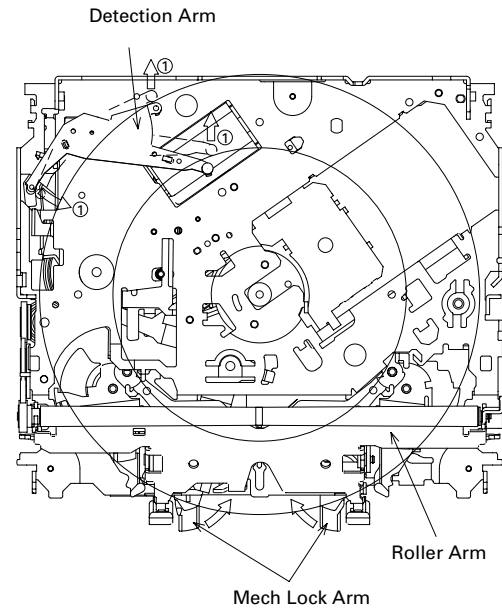
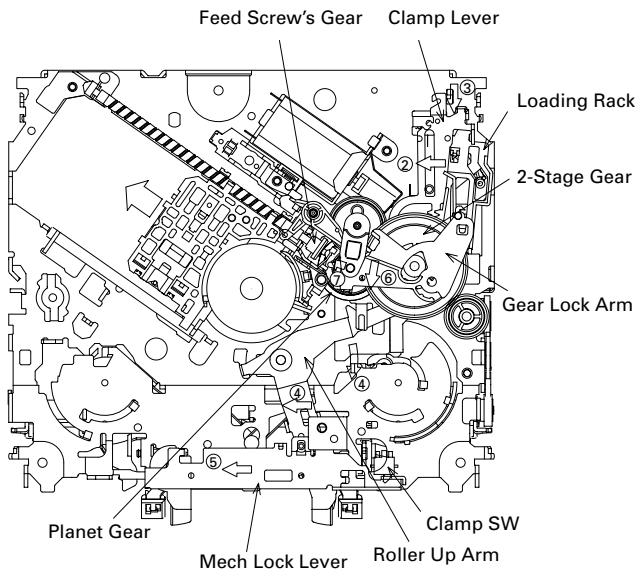
● Disc centering mechanism

1. In case of 12cm-disc, the 12cm-Disc Detection Arm rotates, and with such rotation, it raises the Centering Arms to retreat the arms from disc's trace. The disc passes through under the arms, and at the inner part, it is centered.
2. In case of 8cm-disc, it is just centered at the position where its edge touches the front portion of the Centering Arm.



● Clamp actions

1. When an 8 or 12cm disc is placed on the center of the spindle, the detection arm starts moving.
2. The movement of the detection arm engages the loading rack with the 2-stage gear.
3. The clamp lever slides to lower the clamp arm. At this time, the roller up arm rotates to separate the roller arm from the disc. The roller arm moves the mech lock lever and turns the mech lock arm to release the mech lock. At the position where the clamp switch is turned off, the clamp operation ends.
4. After the clamp operation, the clamp lever moves to rotate the gear lock arm. The planet gear separates from the 2-stage gear to get engaged with the pickup feed screw's gear. Then the carriage operation will start.



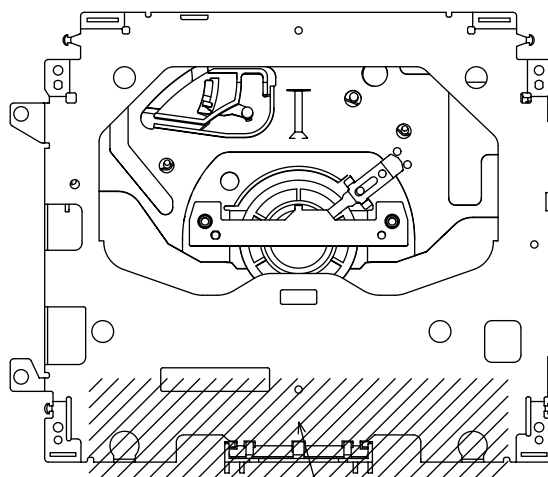
● Eject actions

1. Eject actions start when the Pickup is fed to the position inner than "Home SW ON" point in the internal circumference of the circle, caused by backward rotation of the Load Carriage Motor. Eject actions follow the foregoing procedures (steps taken in loading, centering and clamping actions), but each action in those steps is performed in reversed manner.
2. In case of 12cm-disc, Eject is completed when SW3 completes its condition- transition of OFF → ON → OFF.
3. For 8cm-disc, Eject is completed when SW2 completes its condition-transition of OFF → ON → OFF.

3. DISASSEMBLY

● How to hold the Mechanism Unit

1. Hold the top and bottom frame.
2. Do not squeeze top frame's front portion too tight, because it is fragile.

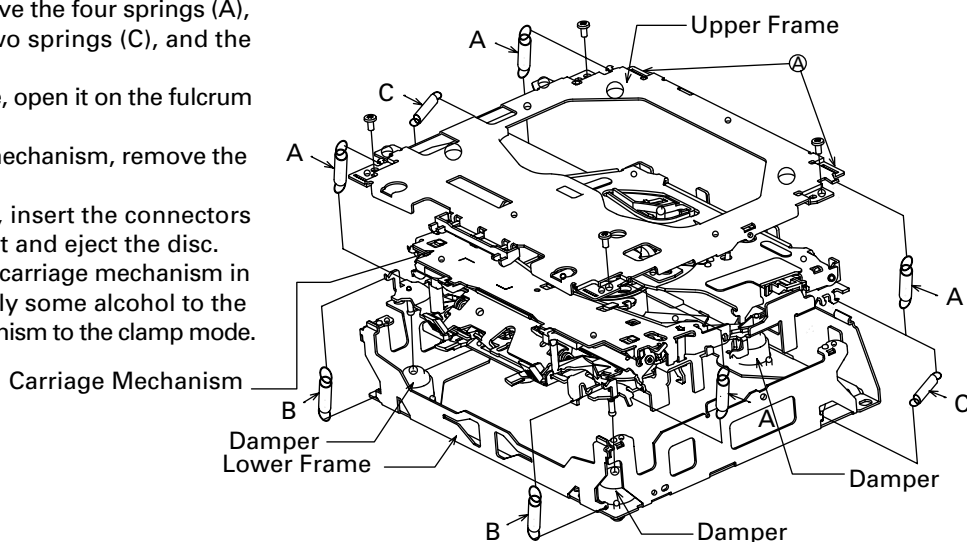


Do not squeeze.

● Removing the Upper and Lower Frames

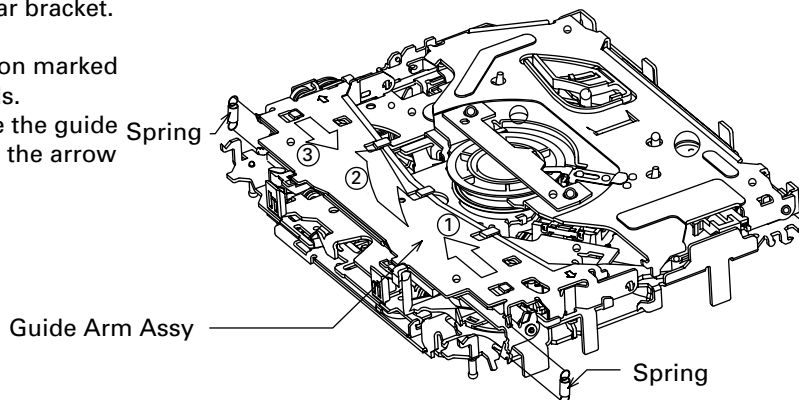
1. With a disc clamped, remove the four springs (A), the two springs (B), the two springs (C), and the four screws.
2. To remove the upper frame, open it on the fulcrum A.
3. While lifting the carriage mechanism, remove the three dampers.
4. With the frames removed, insert the connectors coming from the main unit and eject the disc.

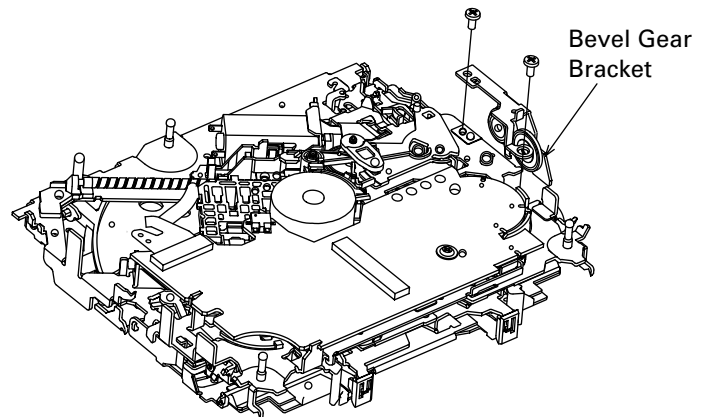
Caution: Before installing the carriage mechanism in the frames, be sure to apply some alcohol to the dampers and set the mechanism to the clamp mode.



● Removing the Guide Arm Assy

1. Remove the upper and lower frames and set the mechanism to the clamp mode.
2. Remove the two springs.
3. Remove the two screws and bevel gear bracket. Note that the gears come off.
4. Slide the guide arm assy in the direction marked with the arrow (1) and open it upwards.
5. At the angle of about 45 degrees, slide the guide arm assy in the direction marked with the arrow (3) to remove it.

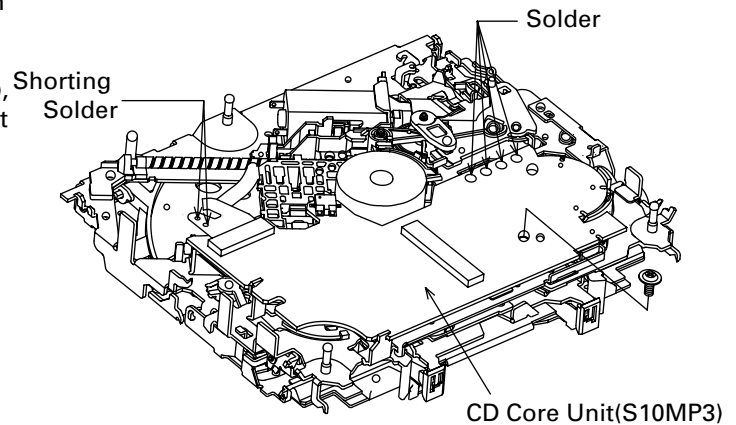




● Removing the CD Core Unit(S10MP3)

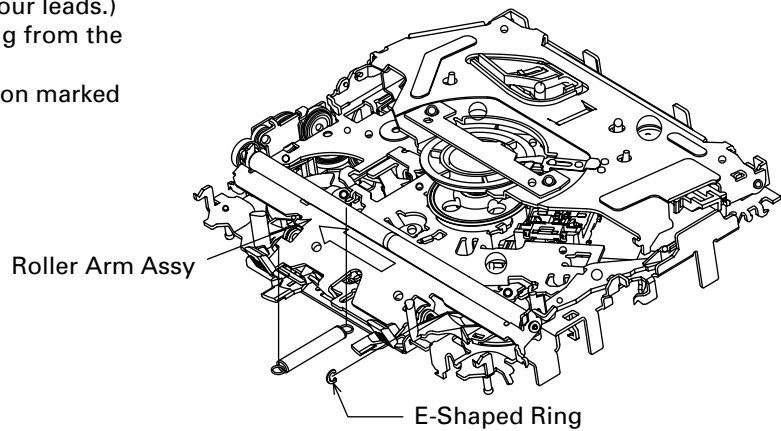
1. Apply shorting solder to the Pickup flexible cable. Disconnect the cable.
2. Remove the solder from the four leads, and loosen the screw.
3. Remove the CD core unit(S10MP3).

Caution: When assembling the CD core unit(S10MP3), set the mechanism to the clamp mode to protect the switches from any damage.



● Removing the Roller Arm Assy

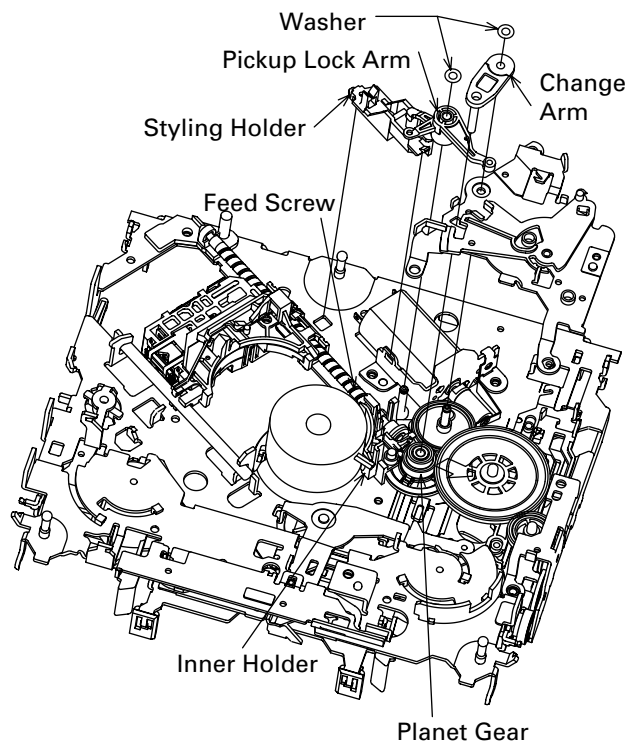
1. Remove the guide arm assy and set the mechanism to the eject mode.
2. Remove the CD core unit(S10MP3). (You do not have to remove the solder from the four leads.)
3. Remove the spring and E-shaped ring from the fulcrum shaft.
4. Slide the roller arm assy in the direction marked with an arrow.



● Removing the Pickup Unit

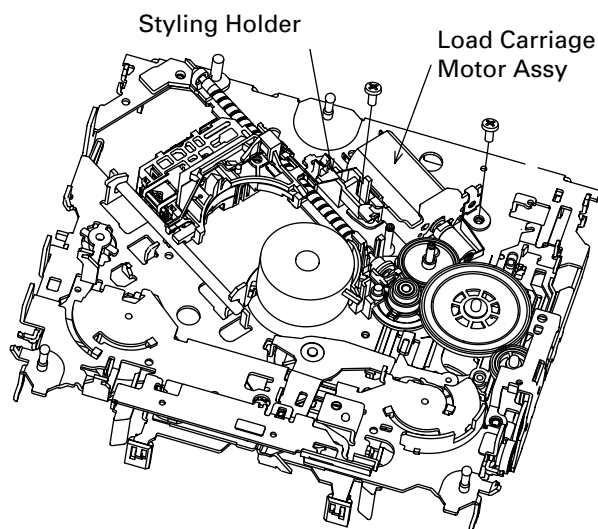
1. Set the mechanism to the clamp mode.
2. Remove the lead wires from the inner holder.
3. Remove the two washers, styling holder, change arm, and pickup lock arm.
4. While releasing from the hook of the inner holder, lift the end of the feed screw.

Caution: In assembling, move the planet gear to the load/eject position before setting the feed screw in the inner holder.



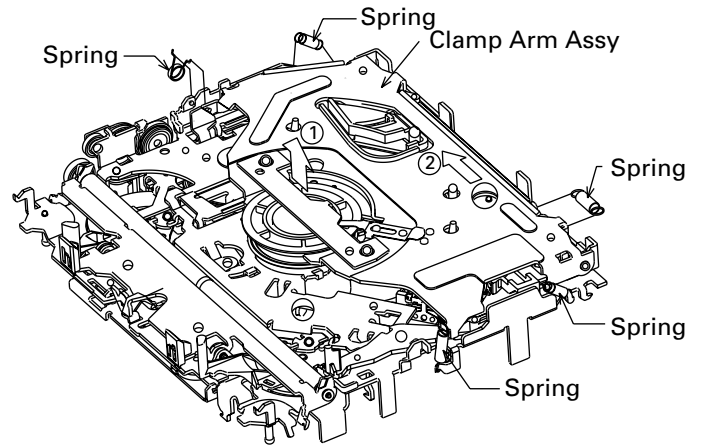
● Removing the Load Carriage Motor Assy

1. Release the leads from the styling holder and remove the holder.
2. Remove the two screws.
3. Remove the load carriage motor assy.



● Removing the Clamp Arm Assy

1. Remove the five springs.
2. While lifting the clamp arm assy, slide it in the direction marked with the arrow (2) to remove it.



● Removing the Spindle Motor

1. Remove the two screws. Take off the spindle motor.

